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THE SEA is empty to the eye. But underneath, a submarine slides, stalking surface prey. Above, an airplane also hunts with electronic eyes and ears. Inside, patterns form on green screens, telltale patterns, deadly patterns to the submarine beneath.

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This is the work for which the twin-engine Grumman S2F-1 was designed and built. She has long range and is equipped to navigate through almost all kinds of weather. She is advanced, ready today to do a job years from now. One reason the U. S. Navy knows it can depend on Grumman aircraft.

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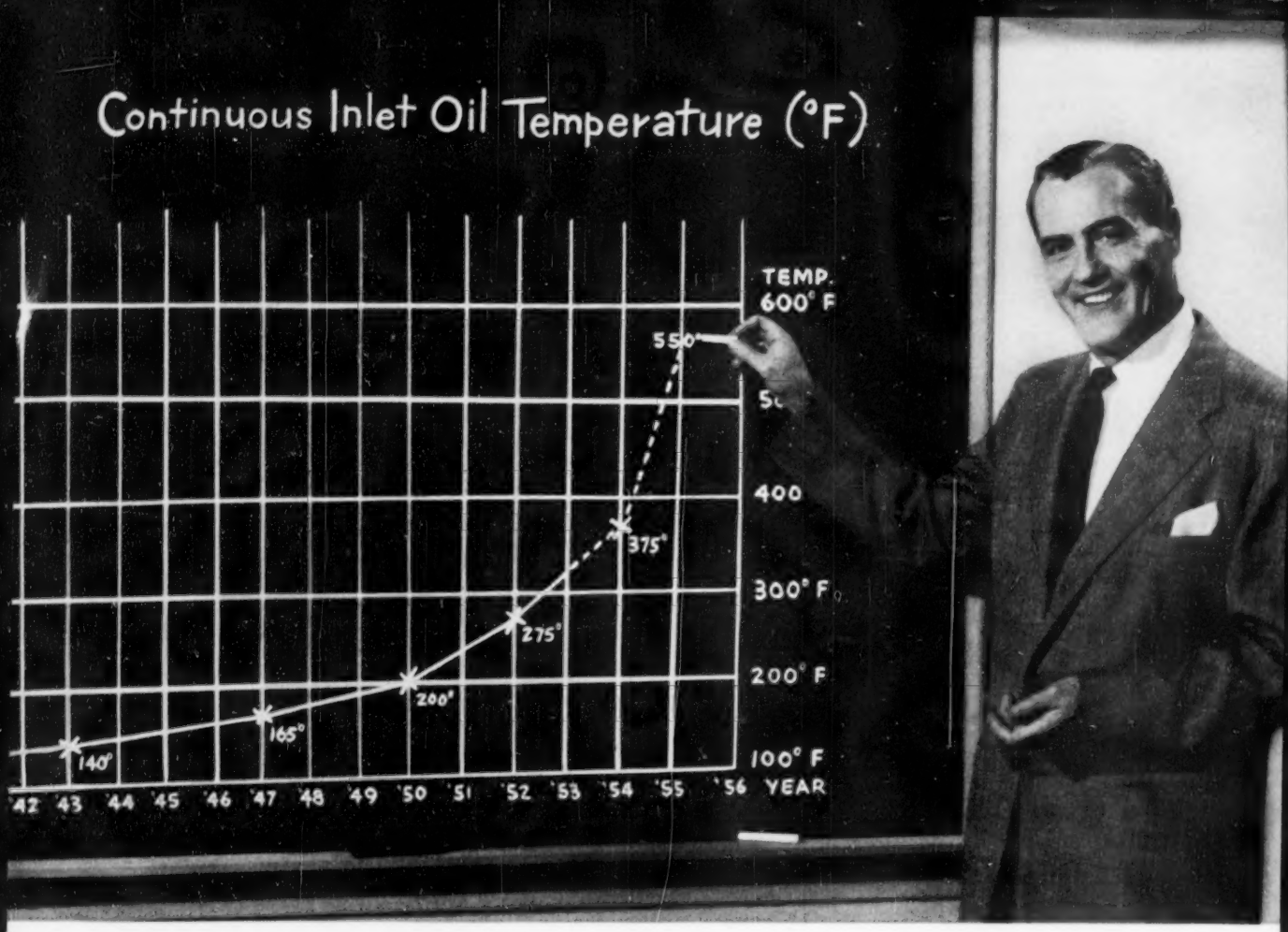

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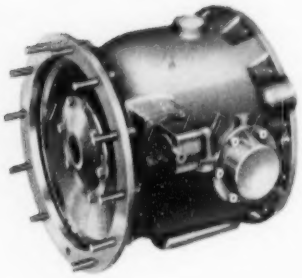

THREE TYPES OF DRIVES

. . . are now available to provide safe, sure, accurate control for constant frequency a-c power generation in the air. A wide variety of adaptations has been developed to simplify problems of airframe and engine manufacturers. Sundstrand engineers stand ready to co-operate with you to the fullest extent in meeting drive requirements caused by your increasing electrical load. May we work with you?

Comparison of past and present Sundstrand Drive specifications reveal the steady advance made in coping with ever-increasing inlet oil temperatures. Ten years ago these temperatures were so moderate they did not pose a serious problem. Today, inlet oil temperatures have doubled, with drive specifications commonly calling for continuous operation with inlet oil at 275°F. One type of drive has a specification demanding continuous operation at an inlet oil temperature of 300°F, and this drive has actually operated successfully for many hours with inlet oil at 325°F! As the chart above shows, temperatures are expected to double again in the very near future. This presents our engineers with serious problems, for they must pioneer in an entirely new field of high temperature hydraulics. This is a field in which satisfactory new methods and materials must be developed, for they do not yet exist. Year by year, these new developments must enable the drive to operate successfully under increasingly severe environmental conditions. We are confident that Sundstrand's *reliable* research, *expert* engineering, and *precision* production will provide the answer to these new problems.

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PLAN TO VISIT OUR BOOTH AT THE 10TH AIRCRAFT ELECTRICAL SOCIETY DISPLAY, LOS ANGELES, OCTOBER 15-16, 1953

B.F. Goodrich offers new way to cut equipment, add to landing safety

AT LAST, something is taken *off* the airplane! B. F. Goodrich takes out the inner tube—and pounds are saved with B. F. Goodrich tubeless tires.

First announced for combat jets like the Navy's Grumman Cougar, the new BFG tubeless airplane tire gives safer high-speed landings and take-offs, cuts weight, simplifies assembly and maintenance.

Like the famous B. F. Goodrich Tubeless Tire for passenger cars, introduced five years ago, the new airplane tire has a patented inner lining that's part of the tire itself. There's no tube to go flat—no tube to bunch up or shift during landings and take-offs.

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Another B. F. Goodrich first in aviation, the new high pressure tubeless tire for combat jets is the latest example of BFG's leadership in rubber research and engineering.

Send this coupon for blueprint showing cross section of the B. F. Goodrich tubeless tire, how it is mounted easily on standard wheels, other advantages. *The B. F. Goodrich Company, Aeronautical Division.*

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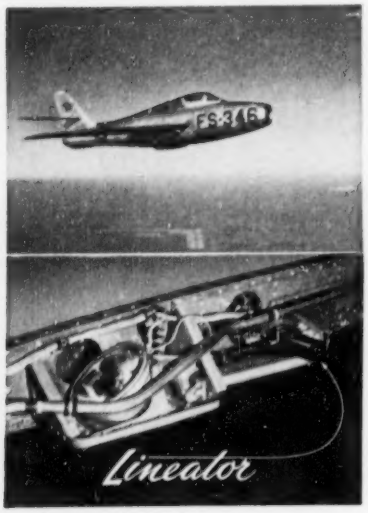

Republic engineers needed an actuator for the landing light retractor in the F-84F fighter. With space too limited for any standard light retractor, they designed their own and specified the R-244M13 Lineator. Its compact design and 250-lb. rating do the job.

The adaptability of Airborne electromechanical actuators is evidenced by wide use throughout the aircraft field.

Perhaps you have a design problem where space and power are factors. See our literature in the I.A.S. Aeronautical Engineering Catalog, or write direct to us.

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Aviation Week

Volume 59 | October 5, 1953 | Number 14

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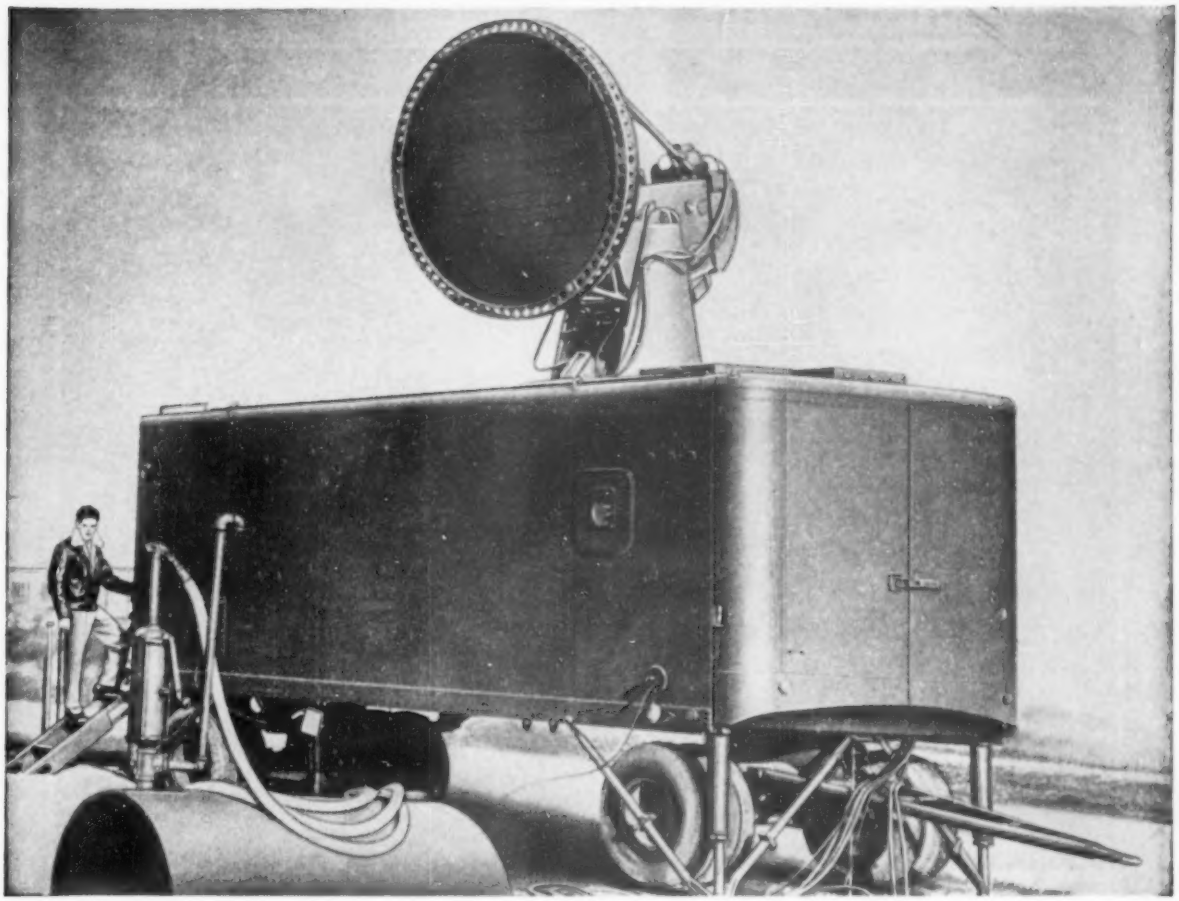

It takes PRECISION MANUFACTURING to say "HERE THEY COME"

The big, round screen on top of the mobile trailer, is a radar antenna—part of a new fire-control system for anti-aircraft gun batteries.

Details are classified for security reasons. However, many improvements and refinements, make the device more informative, effective and flexible than its predecessors.

We make the radar antenna and the intricate, precision gears that actuate the system, for the Western Electric Company. Gears that must be precise, because gear errors of ten-thousandths of an inch, mean miles in the sky.

Ours is a record of 37 years of precision design, engineering development and production. Today, 90% of our defense work is in aircraft and ordnance contracts. We help work the miracles of exactness which strengthen the defenses and protect the security of America.

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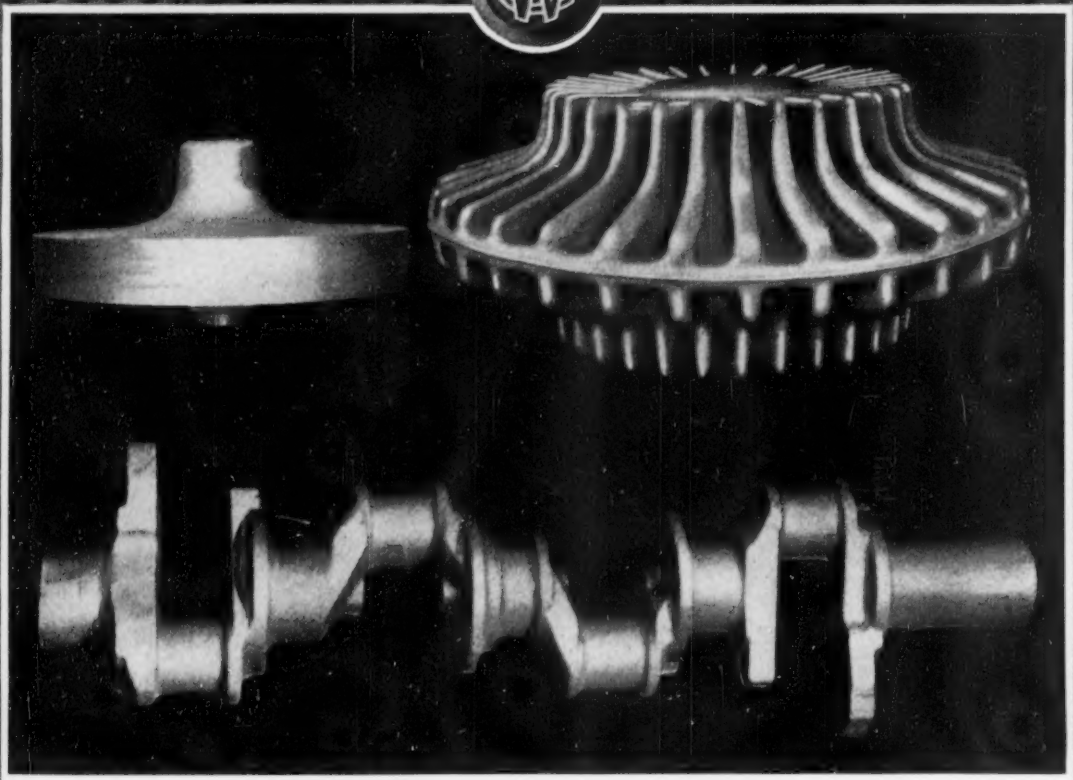

Wyman-Gordon— specialists in the vital forgings of the internal combustion engine since its inception—is today the largest producer of crankshafts for the automotive industry and of all types of forgings for the aircraft industry. Be it crankshafts and other vital forgings for the piston type engines or turbine wheels and impellers for turbo jets—there is no substitute for Wyman-Gordon experience.

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NEWS DIGEST

Temco's 75-Day Wonder

Temco Aircraft Corp.'s Plebe performs for the Navy during evaluation tests started last week at Pensacola to determine the outstanding replacement for the SNJ primary trainer (Aviation Week Sept. 28, p. 14). First flight photo of the new trainer—designed, manufactured and flown in 75 days—shows its free-blown bubble canopy. The Plebe is powered by a 225-hp. engine.

Domestic

CAA budget for fiscal 1955 tentatively is slated to be cut $20 million to an estimated $110 million, compared with this year's $138-million budget and $149 million in fiscal 1953 (Aviation Week Sept. 28, p. 80). Detailed breakdowns of the slashes were not set last week, but the cuts are expected to include: aviation safety, 10%; airport control tower, 6%; airport construction subsidy, complete phaseout.

President Eisenhower is slated to get a new USAF Turbo Compound-powered Super Connie, now being modified by Lockheed Aircraft Corp. The President's present transport, the Columbine, is a standard Constellation.

Crash of a Resort Airlines C-46 last week killed 23 persons. The twin-engine transport, nearing the end of a military charter flight from Camp Kilmer, N. J., plunged out of control and burned during an aborted landing at Standiford Field, near Louisville, Ky.

Airlines' accelerated amortization incentive to buy 600 new planes between Jan. 1, 1950, and June 30, 1955, will continue in effect, Commerce Undersecretary Robert Murray announced last week. He recommended to the Office of Defense Mobilization that the incentive be maintained. Some 367 new commercial transports already have been bought under the program, which grants five instead of seven-year write-off on transport flight equipment available for mobilization.

Pacific airlift contract rates will be changed by competitive bids this month, USAF Assistant Secretary Roger Lewis told airlines last week. Lift decreased from 52 to 34 planes Oct. 1. Meanwhile, Air Force is increasing rental rates on surplus C-54s from approximately $4,800 a month to about $12,500.

New subsidiary to Fairchild Engine & Airplane Corp. will be established at Amsterdam to bid for maintenance and parts contracts on C-119s operated by USAF in Europe. Subcontractor for the new firm, Fairchild Aviation N. V., will be Fokker Aircraft Factories.

First Riley Twin Navion powered by two 150-hp. engines last week was delivered by Temco Aircraft Corp.'s Greenville, Tex., plant. Temco is producing the converted executive craft for Riley Aircraft, Ft. Lauderdale, Fla., which raised the Navion's price tag from $25,850 to $28,500.

Lightplane exports by four U. S. companies in August totaled 60 aircraft valued at $369,747, bringing the number of units shipped overseas during the first eight months of 1953 to 373 at $2,671,338, Aircraft Industries Assn. reports. The companies: Beech Aircraft Corp., Cessna Aircraft Co., Piper Aircraft Corp., and Taylorcraft, Inc.

Transocean Air Lines last week reduced fares 10% to $109 on DC-4 flights from the West Coast to Hawaii, claimed the new tariff is the "lowest per-mile fare in the history of air transportation over sea routes."

C. Herschel Schooley has been appointed acting director of public information for the Defense Department. The former press chief of the department's Public Information Office succeeds Andrew H. Berding, who resigned to become assistant director of program and policy for the U. S. information agency.

Charles H. Rennwald, of General Motors Corp.'s air transport section, died of a heart ailment Sept. 29 in Detroit. Former president of Servair, Inc., Rennwald also had been associated with Pennsylvania Central Air Lines (Capital), American Airlines and National Air Transport during the past 21 years.

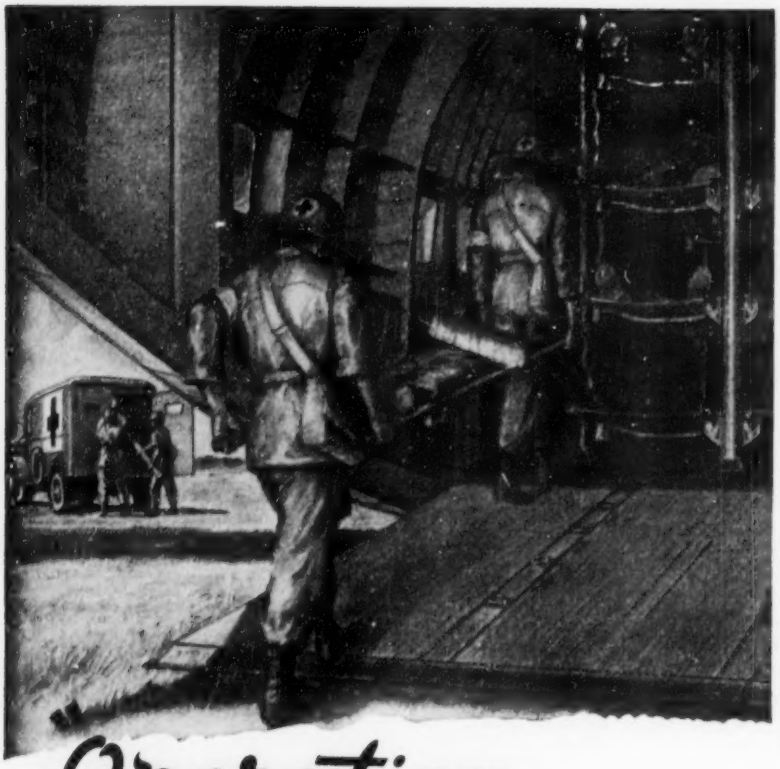
James Simpson, vice president-general manager of Douglas Aircraft Co.'s Long Beach (Calif.) Division, died of a coronary occlusion last month at the airframe plant. He was 54.

International

Avro Canada last week announced it has purchased a government-owned jet engine plant near Toronto in a "multi-million-dollar deal" financed by the parent Hawker Siddeley Group of Great Britain.

Turkish Airways DC-3 crashed during an attempted takeoff from Ankara (Turkey) Airport Sept. 25, killing seven persons.

Million-dollar expansion of domestic and international routes is planned by Compania Cubana de Aviacion, Cuba.



"Operation Lifesaver"

Air evacuation of wounded men from front lines to rear area hospitals is possible today with the development of the Chase Assault Transport.

Casualties no longer risk wound complication or loss of life because of delayed evacuation, as modern techniques, made possible by the Chase C-123 Transport, move casualties directly from combat zones to base area hospitals. No other plane is built to take the brutal punishment of these hazardous front line assignments.

Combat infantrymen, quickly recognizing its unique value, dubbed it "Operation Lifesaver."

Chase AIRCRAFT CO., Inc.
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The Aviation Week

October 5, 1953

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Washington Roundup

More or Less Air Power?

The second important indication of Administration thinking in terms of more money for air power—and tax increases—is from Republican Sen. Alexander Wiley, chairman of Senate Foreign Relations Committee. His unequivocal statement:

"Defense expenditures are going to have to increase because we simply are not adequately prepared on a continental basis. We are all, of course, hoping that we will get increased efficiency in our armed forces and in other government departments, so we can make necessary savings.

"The Eisenhower Administration is leaving no stone unturned in order to try to save every possible dollar which it reasonably can. But it cannot accomplish budget miracles. So inevitably, we are having to search for new sources of revenue."

First hint of a boost in air power funds for fiscal 1955 was the President's "no-tax-too-great-to-meet-the-enemy" observation in Boston.

But the cut-defense-and-taxes faction is standing pat. Budget Director Joseph Dodge's aim: keep fiscal 1955 defense money at least $5 billion below this year's $34.5 billion.

First showdown in the conflict—before National Security Council—is now getting under way. Defense Department hopes to submit to NSC this week a rough estimation of the cost of a fiscal 1955 defense program based on Joint Chiefs of Staff's recommendations. Defense Comptroller W. J. McNeil expects to have NSC direction and start working out details of the coming-year budget by mid-October.

Buying European

U.S. probably will put up about $200 million this year for off-shore purchase of European planes for NATO defense under the Joint Aircraft Program. That is what Air Force is recommending to Defense Department. It is more than 33% below last year. The fiscal 1953 off-shore JAP program totaled $583 million, with U.S. putting up $320 million.

The fiscal 1954 program should be announced in about a month. The outlook: U.S. will finance purchase of the same types as in the 1953 program, with the possible exception of the British Sea Hawk.

Air Program Lags

Money figures show the aircraft production program is lagging:

• **USAF and Navy** started off fiscal 1954 in July with $3.1 billion in unobligated aircraft procurement funds—USAF with $2.7 billion and Navy with $422 million.

• **New plane ordering** during July only nibbled at this: only $172 million obligated—$149 million by USAF and $23 million by Navy.

• **With $4.9 billion** in new money for 1954, USAF and Navy had a total of $7.8 billion on hand for new plane orders at the beginning of August. This means an average obligating rate of around $700 million a month for the rest of the year—if the money is to be obligated.

• **Spending**—indicative of deliveries—is lagging, but not so sharply. During July, it totaled $587 million for USAF and Navy. Estimate of the Wilson program submitted to Congress three months back was $717 million. Unspent USAF and Navy funds for aircraft and related procurement now total $26 billion.

Congress: Wait and See

Congressional Democrats and Republicans both appear content, in the main, to mark time while the Administration draws up its programs—and leave politicking and fireworks for the coming session. Investigations are unspectacular, largely of a fact-gathering nature.

Senate Armed Services Subcommittee, headed by Sen. Francis Case and now in Europe looking into air base construction and other military real estate, is due back this week.

Sens. Homer Ferguson and Ralph Flanders are charting an inspection tour of aircraft plants to get production data first hand. Ferguson is chairman of the Military Appropriations Subcommittee and Flanders a member of the Armed Services Committee.

Armed Services Investigating Subcommittee staff, under direction of Fred Rhodes, former staff member of Central Intelligence Agency and Joint Atomic Energy Committee, is reviewing defense fiscal management.

House Armed Services Investigating Subcommittee, headed by Rep. William Hess, is in Europe looking into off-shore aircraft procurement and other NATO subjects.

Senate Appropriations Investigating Committee staff is reviewing charges by Sen. Russell Long that Air Force's pilot training costs are far higher than for comparable training in civilian schools.

Senate Commerce Subcommittee's review of aviation law and policies, with emphasis on the role of nonskeds, is dragging. Staffman Frank Keenan, under direction of subcommittee chairman Sen. John Cooper, has been information-gathering. But subcommittee members Sen. Dwight Griswold and Sen. Edwin Johnson have shown little interest, report they won't return to Washington until the reconvening of Congress.

ODM Outlook

Recently chartered, the permanent Office of Defense Mobilization, under director Arthur Flemming, after much personnel shuffling and cutting, almost has completed its organization and is ready to go as a policy agency.

• **Victor Cooley,** board chairman of Southwestern Bell Telephone Co., is deputy director. Five assistant directors have been named—for stabilization, telecommunications, non-military defense programs, manpower, financial policy. Two remain to be named: for materials and production requirements and programs.

• **Military aircraft policies** will be handled by the Production Requirements Division.

• **New ODM is following the last Administration's policy** of keeping a mobilization base of aircraft and other military facilities, not required in current production, in ready-to-go status. Machine tools will be kept in or near shut-down plants at which they would be used in an emergency. Defense Department has about $1 billion for machine tool purchases.

• **The first major ODM action** will be announcement of new expansion goals. Key issue: whether there should be a third-round expansion of the aluminum industry.

—Katherine Johnsen

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WHO'S WHERE

In the Front Office

Arthur G. Ranslow is new vice president-production of Robinson Aviation, Inc., Teterboro, N. J. **Charles R. Davis** has been promoted to vice president-West Coast district and **H. Erich Nietsch** to manager of the Industrial Division.

Matthew M. Gouger, former vice president of Glenn L. Martin Co., Baltimore, has been elected vice president-personnel relations of General Aniline & Film Corp., New York.

Paul W. Brannon has been appointed vice president-manufacturing of Borg-Warner Corp.'s Pesco Products Division, Bedford, Ohio. In Borg-Warner's new Marvel-Schebler Products Division, Decatur, Ill., executives include **S. S. Meadows**, vice president-manager; **Glen Bamberger**, works manager of carburetor and aircraft departments, and **Edward Walsh**, assistant chief industrial engineer for the two departments.

Capt. John W. King (USN Ret.) is new assistant to the president of Stroukoff Aircraft Corp., West Trenton, N. J.

Rudolph F. Gagg, former president of Air Associates, Inc., Teterboro, N. J., has joined the administrative staff of the vice president and group executive of Bendix Aviation Corp., also at Teterboro.

Changes

Louis T. Rader is general manager of General Electric Co.'s new specialty control department at Schenectady, N. Y. Managers appointed to his staff: **K. N. Bush**, manufacturing; **H. L. Palmer**, engineering; **J. P. Rutherfoord**, marketing; and **C. S. Van Wormer**, finance.

J. B. Edwards has resigned as chief engineer of Hiller Helicopters, Palo Alto, Calif., and will return Oct. 15 to Douglas Aircraft Co., Santa Monica, Calif.

Jack G. Smith has been appointed chief engineer of Varo Manufacturing Co., Garland, Tex. **Walter J. Jagmin** is new plant manager.

Enoch J. Durbin has become research associate in charge of instrumentation at Forrestal Research Center, Princeton, N. J.

Wesley E. Weber, former materials process engineer with Hughes Aircraft Co., has joined Furane Plastics, Inc., Los Angeles.

R. L. Anderson has been appointed service manager of Champion Spark Plug Co.'s new reorganized and enlarged aviation department, Toledo, Ohio.

Honors and Elections

Ralph S. Damon, president of Trans World Airlines, received the National Association of Foremen award as "National Management Man of the Year" during the annual NAF convention Sept. 25 in Milwaukee.

Ed Nelson of Chicago is new president of Air Mail Pioneers Assn. Other officers: **Charles W. Larsen**, Los Angeles, vice president; **Fred Toombs**, Washington, D. C., secretary, and **Edward Cooper**, Los Angeles, treasurer.

INDUSTRY OBSERVER

► Republic Aviation already is grooming a potential successor to the Convair F-102 as a supersonic all-weather automatic interceptor. The F-102 is designed for a speed of Mach 2. The Republic F-103 is designed for Mach 3 and is expected to gross nearly 40,000 lb. It will be powered by a Wright J67 turbojet for landing and takeoff and a ramjet for supersonic operations. A valving arrangement operated by the pilot switches airflow from turbojet to ramjet. The F-103 configuration features a long, needle fuselage with a delta-wing well aft.

► **Convair's F-102 is scheduled to make its first flight at Edwards AFB next month. Lt. Col. Dick Johnson, former holder of the world speed record, is leaving USAF to join Convair in charge of flight test operations. He will pilot the F-102 during its initial flight test program.**

► Grumman has a new Navy fighter in the works, featuring a slim fuselage reminescent of the Hawker Hunter. It now is earmarked for a Wright J65 turbojet, but may be switched to a General Electric J73.

► **Glenn L. Martin Co. is negotiating a large subcontract with McDonnell Aircraft Corp. to build wing panels for McDonnell F-101 long-range USAF penetration fighter.**

► Allison has completed a 50-hr. pre-flight test on its T56, a 3,750-hp. turboprop scheduled to power the Convair YC-135 military version of the Convair 340. Convair is scheduled to convert two 340s to T56 turboprops.

► **Industry observers have noted the stack of Pratt & Whitney J57 turbojets already delivered at the Douglas El Segundo Division for production versions of the F4D Navy fighter. It is one of the few cases in the industry where the engines are available when required for the airframes.**

► Douglas C-133 transport will use Curtiss-Wright 18-ft. blade propellers to deliver the power from the four P&WA T34 turboprops. The blades will be extruded. YC-124B, the T34-powered prototype of the C-133, is scheduled to fly before end of the year.

► **Plans for a flight over the North Pole by two Piasecki YH-21 twin-rotor helicopters have been canceled by USAF because of lack of sufficient escort available over the last 900-mi. leg from Thule, Greenland, to the Pole. The two YH-21s successfully completed a 4,000-mi. flight from Eglin AFB, Fla., to Thule, where they will be based for Arctic air rescue operations.**

► Curtiss-Wright plans to flight test its J67 split compressor turbojet in the bomb-bay of a specially modified North American B-45 jet bomber.

► **General Electric has a new turbojet (X-25) under development aimed at about 12,000 lb. thrust, relatively low frontal area and a very good weight-power ratio.**

► While no jet engine manufacturer has come up yet with a plan for using reverse thrust in which losses are acceptable, every U.S. manufacturer in the engine business is doing some research and planning on this new development which has obvious multiple uses if problems can be licked.

► **Latest General Electric jet engine to be certificated by CAA for commercial aircraft use is the J47-GE-23.**

► The Australian-built Avon-powered Sabre has been showing excellent performance results in first flight tests. The bigger Avon was fitted into the Sabre by slicing the fuselage lengthwise on a horizontal plane and fitting in two side pieces to make the fuselage higher at no increase in width.

► **Considerable engineering effort is going into the design of tree-top level, highspeed bombers, with about 300 lb./sq. ft. wing-loading. British and American design teams have projects in the works; one British project is reported to be aimed at a flight date of 1956.**

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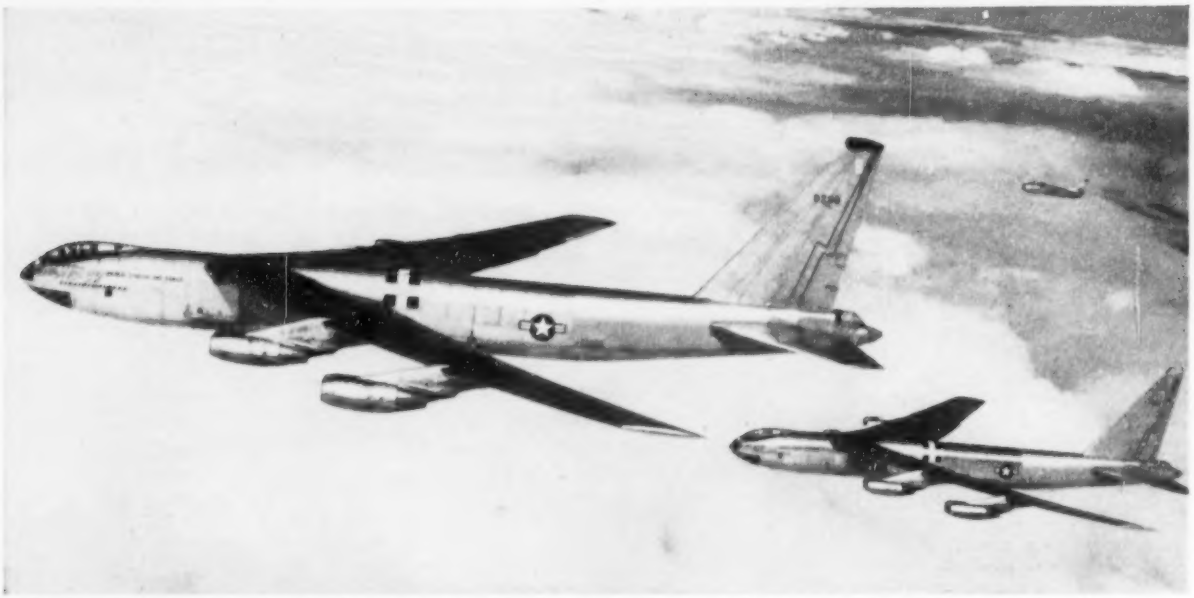


A LARGE FLEET OF B-52s, like these prototypes (XB-52 left, YB-52 right), is being ordered by Air Force as H-bomb carriers.

New Air Power Buildup:

USAF Orders H-Bomb Fleet, More F-100s

- **Large-scale production of B-52s is slated for Boeing's Seattle plant; AF sets up Wichita as second source.**
- **Talbott forecasts increase in new plane contracts, end of cutbacks in airframe and engine programs.**

By Robert Hotz

Top-level USAF decision to build a large fleet of hydrogen-bomb-carrying Boeing B-52 Stratofort jet bombers was confirmed officially last week by Air Force Secretary Harold E. Talbott.

AVIATION WEEK reported on June 8 (p. 15) that USAF had cast the dies for a big B-52 production program involving several hundred of Boeing Airplane Co.'s new bombers (with additional references July 6, p. 11, and Sept. 7, p. 13).

Talbott also offered the following guides to future AF procurement policy:

- **Expenditures** for aircraft will continue to rise during fiscal 1954.
- **Air Force** has reached the end of its downward revision of aircraft procurement and is beginning an upward trend of new orders.
- **USAF expects** to plow the billion dollars saved by recent airframe and engine contract cancelations into new orders for later model planes and powerplants.

The Air Force Secretary announced:

- **Boeing-Wichita** will be put into production as a second source for the B-52. The bombers now are produced only at the company's Seattle Division.
- **F-100 Super Sabre** has been ordered into accelerated production at North American Aviation's Inglewood, Calif., plant. Additional orders come to approximately $250 million.
- **Chase C-123B** will be put into production. USAF decision on which of five bidders will get the order will be made within a few days. Convair is expected to get the order for its Ft. Worth Division.
- **More trainers** probably will be purchased despite recent cancelation of production orders for three types of training planes.
- **Some Convair B-36 bombers** will be converted for use as aerial tankers after their useful life as a first-line bomber is over (AVIATION WEEK Sept. 1, p. 13).

Talbott said the B-36s would not be withdrawn from active service even after the B-52 takes over as the first-line long-range strategic bomber.

▶ **Maximum Effort**—Talbott indicated the B-52 production program would involve a maximum production effort at Boeing's Seattle plant plus second-source production at Wichita.

USAF is committed to a $250-million production tooling program at Wichita but so far has not placed any orders for B-52s at the division.

Assistant USAF Secretary Roger Lewis said funds for the Wichita B-52 order were available in fiscal 1954 budget. Talbott emphasized they would be placed in time to allow Boeing sufficient lead time to meet delivery schedules.

▶ **Order Increased**—Lewis said USAF already had increased the size of the original production order for B-52s at Seattle. This orginal order called for an estimated 70 RB-52A photo-reconnaissance versions of the jet bomber.

Wichita production eventually will increase monthly B-52 production by as much as 40% over the previously planned peak for Seattle, Talbott said.

Initial production deliveries of the B-52 at Seattle are scheduled for early next year, according to Lewis. Initial

production rate at Seattle calls for approximately four bombers a month.

"The Seattle plant is now well tooled for B-52 production and production is proceeding at a satisfactory rate," the USAF Secretary said. Total B-52 production program already involves more bombers than will be required to equip the seven heavy bomber wings called for in the 143-wing program, according to Talbott.

▶ **Seattle Vulnerable**—Vulnerability of Seattle as a target for Russian atomic or hydrogen bombers was a major factor in establishing second-source production at Wichita.

"We were just not happy with a single B-52 production source in a target such as Seattle," Talbott said.

▶ **Reshuffled Priority**—Production of the Boeing B-47 will continue at Wichita until the B-52 production is phased in. It will take about 18 months to tool the Wichita B-52 production line.

If the B-52 priority at Wichita impinges on B-47 production, additional B-47 capacity would be available at the Lockheed Aircraft's Marietta, Ga., plant and Douglas Aircraft's Tulsa, Okla., factories.

Actually, USAF does not expect any spillover of Wichita B-47s to these plants. Tulsa is scheduled for a large B-47 cyclic maintenance program and Marietta is earmarked for the Lockheed C-130 turboprop transport production.

▶ **H-Bomb Carrier**—Talbott declined to answer a question asking if the B-52 can carry a hydrogen bomb. It is believed that some modifications to the B-52 will be required for this mission but that it will be a satisfactory delivery vehicle for this type of weapon.

During earlier top-level USAF arguments on whether the B-52 should be put into large-scale production, its reputed ability to carry a hydrogen-type bomb at speeds of 700 mph. over extremely long ranges utilizing aerial refueling were points stressed by its proponents.

USAF is ordering accelerated production of the North American F-100 because of the remarkable performance of the prototype aircraft during its Phase I and II flight tests—already completed. Talbott said all indications are that the F-100 will meet its final tests successfully, and USAF can see no reason to delay full-scale production.

▶ **Production Doubled**—In testimony before the last session of Congress, Air Force officers said initial production rate for the F-100 was scheduled at 25 planes a month but that this could be increased to 50 a month in the same plant by an accelerated production program.

Talbott said that when he and Roger Lewis visited the North American plant two weeks ago, production versions of the F-100 "were moving down the line in good quantity."

Atomic Contract

Air Force has permitted Lockheed Aircraft Corp. to reveal that it has a contract for preliminary design study of nuclear-powered aircraft. Lockheed has been engaged in this work for some time. It is part of USAF's broad research program in the field aimed at eventual development of nuclear-powered aircraft. Other firms engaged in this type work include: Convair, General Electric, Boeing and Pratt & Whitney Aircraft.

USAF is planning to show the jet fighters publicly for the first time next month in a press demonstration at Edwards AFB, Calif.

▶ **Supersonic Fighter**—The F-100 is one of the largest single-seater fighters ever built, with a gross weight of nearly 30,000 lb.

Wings are swept back 45 deg., and a new tail configuration is obviously aimed at improving stability at the high speeds of which the F-100 is capable.

It has a top design speed of about 800 mph. and has flown faster than the speed of sound repeatedly in level flight, including its initial flight test with North American test pilot George Welch at the controls.

Both the B-52 and the F-100 are powered by the Pratt & Whitney J57 split-compressor turbojet, delivering approximately 10,000 lb. static thrust at sea level. The NAA F-100 is equipped with a P&WA-designed afterburner that adds an estimated 5,000 lb. to basic engine power for short intervals.

▶ **Screening Finished**—Talbott indicated USAF had completed "selective screening" of its aircraft and engine procurement program and had eliminated all of the aircraft it planned to for the present.

He said, other new aircraft orders would be forthcoming in the near future in addition to the C-123B, B-52 and F-100 programs.

Funds recovered from recently announced cancelations and those available in the fiscal 1954 budget will be used for the new orders, the Secretary said.

Airline Rate Cuts Hold Key to Future: Hildred

International Air Transport Assn. director general Sir William Hildred says in his annual report to IATA this week that passenger and freight rate cuts will continue to be the key to airline growth and increasing public benefit.

"All we ask for now is a few years in which (the) fall in unit revenue can be translated by an increase in passenger volume into greater revenue total," he says.

Government pressures forcing IATA to cut rates too fast could wreck the industry, Hildred warns. Airlines must earn and save some profits to expand and to weather business slumps, the director general adds.

Biggest international airline problems today, according to Hildred:

- **Aircoach seasonal imbalance.**
- **Airfreight ground delays.**
- **Tax increase trend.**
- **Government rate interference.**

Without IATA's cooperative rate-making machinery to maintain adequate profit margins and thereby strengthen industry finances, "airline would have been pitted against airline, government against government, in a self-defeating effort to capture markets from its competitors," Hildred says. "If this had been the case, we would not have had such solid achievements to our credit that we could, with confidence, introduce a world-wide system of travel for the masses."

In his plea for government understanding of the airline business, Hildred explains, "I don't ask for generosity—I ask for intelligence—if it is there."

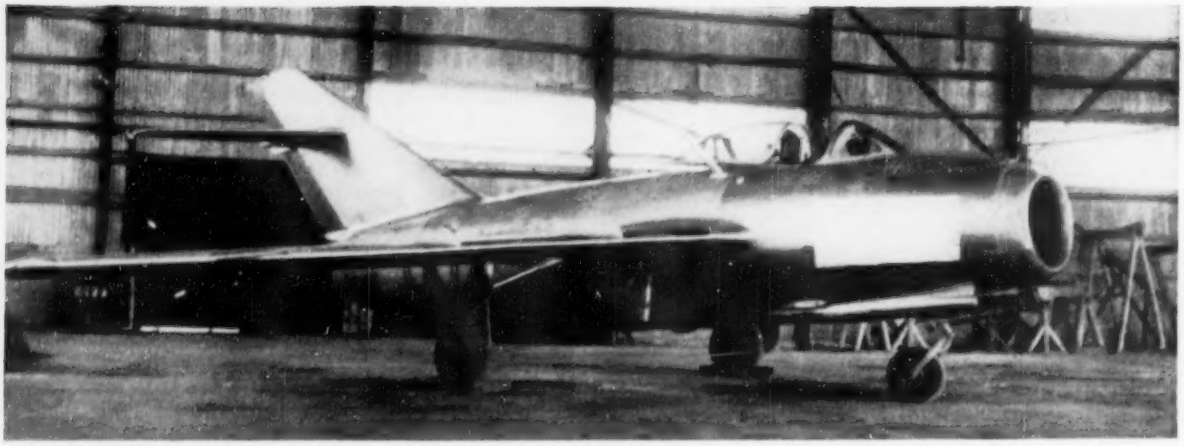
▶ **Problem Solutions**—Among possible developments Hildred suggests to offset major economic problems now facing air carriers.

- **Seasonal aircraft exchange** among airlines to meet local seasonal peaks. "Indeed, if something like this is not done, it will not be long before we arrive at a situation where too much equipment might be available if every airline attempts to adjust its capacity to peak traffic."

Hildred says that while Atlantic summer aircoach boosted passenger volume nearly 50%, revenue increase was less and airline winter revenues actually declined.

- **Airfreight handling** campaign is needed to teach airlines and customs officials the importance of speedy ground processing. "We need a facilitation campaign." Slashing airfreight rates "might well be the next item on our agenda," Hildred believes, and "it is no use our trying to slash rates if (it) . . . only makes a bigger pile of cargo and more infuriated consignees." On this problem, he concludes, "ICAO and IATA must get together on this in a big way and at once."

▶ **Montreal Assembly**—Sir Hildred's annual report opened the association's ninth annual general meeting. This will last all this week at Montreal, home of the 150-man IATA secretariat. The assembly will hear, in addition, reports from chairmen of all the association's standing committees—economic and technical.



RUSSIAN-BUILT MIG-15, flown to Kimpo AFB, Korea, by a North Korean officer, is shown in hangar at the base near Seoul.

Talbott Calls Captive MiG Too Old

The $100,000 MiG-15 flown into Kimpo Air Base would not be worth much to USAF because the jet is a couple of years old, Air Force Secretary Harold E. Talbott said last week.

He said keeping the MiG "would violate the spirit of the armistice."

Talbott added that he did not want to interfere with the "magnanimous gesture" of the President to return the plane to its owners.

▶ **Striking Resemblance**—Washington observers remembered those never-returned B-29s that American pilots flew into allied Russia during World War II after being shot up over Manchuria.

Present Soviet heavy bombers bear a striking resemblance to the B-29.

▶ **Security Block**—The MiG affair was top secret at the Pentagon last week.

After Defense Department snatched the matter from Air Force hands, it clamped a tight security block around the plane.

The MiG was believed to be back in Korea after a roundtrip flight to Okinawa.

▶ **Mid-Flight Shift**—When a North Korean pilot delivered the MiG at Kimpo, USAF lost little time in disassembling the plane and shipping it aboard a Douglas C-124 Globemaster to Wright-Patterson AFB, Dayton, Ohio (AVIATION WEEK Sept. 28, p. 13). The plan had the approval of the Joint Chiefs of Staff and the Defense Department, USAF said.

But suddenly in mid-flight the plane was ordered to return and never got beyond Okinawa. Defense Department decided that the Air Force had acted too hastily. State Department had entered the picture and cautioned President Eisenhower that an international incident was in the making.

▶ **Small Consolation**—Unofficially, Air Force spokesmen made no secret of their disappointment. USAF was counting heavily on flight testing the MiG at Dayton, because it was the first flyable enemy aircraft obtained in three years of effort.

The only consolation seemed to be that there would be time before the plane was claimed to make a thorough inspection of the MiG.

Some observers speculated on whether the jet would be claimed. They reasoned that by doing so, one of the Communist nations involved would be admitting that MiG-15 squadrons are in North Korea.

However, USAF knew a year ago or more that Red forces were bringing crated MiGs into North Korea.

▶ **Offer Withdrawn**—Because it was committed, Air Force paid the North Korean pilot who had ferried the plane to freedom $50,000 for the plane and a $50,000 bonus promised for the first MiG.

The offer then was withdrawn.

Is USAF Testing Russian Jet?

By A. W. Jessup
(McGraw-Hill World News)

Tokyo—A veil of secrecy dropped over a fugitive MiG-15 by Washington raised the serious question last week of whether U. S. Air Force is obtaining flight performance data on the Communist jet fighter.

USAF had hoped to wring out the Russian-built combat plane in the United States after a North Korean pilot delivered it to Kimpo Airfield, Korea (AVIATION WEEK Sept. 28, p. 13), but an order by Defense Secretary Charles E. Wilson halted the move.

▶ **Risky Tests**—Although flight tests by top combat pilots could take place in this theater, base commanders would demand orders from highest officials in the Pentagon before they would risk damaging the MiG—offered for return to its Red owners.

And flight tests are the only conclusive means of obtaining complete maximum performance characteristics of the plane.

▶ **Combat Tipoff**—Air Force fighter pilots told AVIATION WEEK they would give a month's pay or more just to fly the captive MiG-15.

Such flight knowledge would be of inestimable value to USAF if an air war broke out with the Soviet Union.

USAF pilots gave these examples:

• **How to attack** the Communist fighter might be tipped off if flight tests revealed why MiGs sometimes snap into spins for no apparent reason.

• **USAF combat edge** would be strengthened if U. S. jet pilots were familiar with altitude performance characteristics of the MiG-15.

The Communist jets maintained tight, manageable formations over North Korea at altitudes estimated at 55,000 ft. and higher, but F-86 Sabres barely were able to climb to 50,000 ft. and were not too manageable.

▶ **Critical Sacrifice?**—Speculation by observers in this Far East zone produces these possible reasons for the U. S. offer to return the fugitive MiG-15:

• **Communist officials** would be forced into the bad propaganda position of admitting Russia is supplying North Korean forces if the Reds claim their fighter.

• **Red forces** would be denied an excuse to seize any new U. S. planes that landed accidently on Communist soil.

But USAF pilots question whether any of these reasons outweighs the sacrifice of MiG performance data that conceivably could mean victory in future air war.

Hughes Patchup

- **Revolt narrows down to four-man walkout.**
- **Owner claims avionics production not affected.**

Los Angeles—Howard Hughes was busy last week patching up the damage done to his $200-million-a-year avionics concern by a revolt of top management officials (AVIATION WEEK Sept. 28, p. 15).

The multi-millionaire owner of the Hughes Aircraft Co. already had selected a man to replace Gen. Harold L. George, vice president and general manager, and was expected to announce the appointment soon.

He also persuaded some of the top officials who had turned in resignations to change their minds for at least a short period. How long they would remain was a question.

▶ **"At This Time"**—"Out of my company of 17,000 men and women only four have left," said Hughes. "According to my best information, which I believe to be more accurate than any other available, no one else intends to leave the company at this time.

"There has been no effect on the production or output of defense material from this company and there will be no effect."

The key phrase was "at this time."

Barring another sudden shift, this means Dr. R. P. Johnson, head of research and development laboratories, and R. B. Parkhurst, manager of manufacturing, would stay for at least a while.

One source said they had agreed to continue for a 60-to-90-day period. V. G. Nielsen, director of administration, and D. C. Smith, in charge of customer relations, apparently also would remain on the job.

▶ **USAF Warning**—Hughes, under the watchful eye of the Air Force, thus moved swiftly to head off what might have been a disrupting blow at one of the nation's most important defense plants.

When the revolt broke into the open, Secretary of Air Force Harold E. Talbott made a flying visit to Los Angeles, accompanied by Undersecretary Roger Lewis and Lt. Gen. Orval Cook, USAF Deputy Chief of Staff-Materiel.

It is a safe guess that Talbott told Hughes the concern of USAF was with production, not with internal management problems.

But the implied warning was obvious. USAF would take a dim view of an effect the revolt at management levels might have on production.

▶ **Four Gaps**—Through personal intervention, Hughes apparently had succeeded in stemming what might have turned into a mass management walkout at his Culver City plant, one of the nation's largest avionics producers.

Nevertheless, at week's end, it was certain that at least four top names would be missing permanently from the Hughes lineup: Dr. Simon Ramo, chief of operations; Dr. Dean Wooldridge, former head of the Hughes Laboratories; Gen. Harold L. George, general manager, and Charles B. Thornton, assistant general manager.

Ramo and Wooldridge were heading a new avionics company financed by Thompson Products, Inc., of Cleveland. George and Thornton were keeping silent about their new plans.

Whether the others would continue at Hughes under new top management might depend on what changes were made at the plant.

▶ **Open Revolt**—Conflict between the multi-millionaire and his plant management reached a head seven weeks ago when Noah Dietrich, executive vice president of Hughes Tool Co., the parent organization, moved into the Culver City plant on orders from the concern's owner.

This change in previous channels of authority sparked into open revolt a top-echelon discontent that had been brewing for some time.

Questioned about the effect on the defense effort, one of the officials who resigned told AVIATION WEEK: "The situation already was affecting defense production. We felt perhaps the best thing we could do was bring it into the open by resigning in protest."

Although those who resigned insisted the action was on an individual basis, the threatened walkout was so extensive it seemed apparent the revolt had been coordinated.

Asked to explain their problems, one of the departing officials commented: "It's the RKO situation all over again," referring to management troubles at the Hughes motion picture studio.

Sources close to Hughes asserted that the move to put Dietrich in control was made merely to bring the company into line managementwise with other parts of the Hughes empire.

▶ **New Firm**—Regardless of the reason for the flareup, the immediate problem facing Hughes was apparent: to shore up morale at the plant and stop raids on his high-priced talent by other concerns.

The new avionics concern, headed by the two top scientific men who left him, was setting up shop in Los Angeles. Its announced goal: advanced work in guided missiles, radar, computors and electronic controls.

Hughes was acting swiftly last week in an effort to keep production in those same fields flowing at his Culver City plant.

Materiel Czar

A major policy shift giving Lt. Gen. Orval Cook, Deputy USAF Chief of Staff for Materiel, authority over both Air Materiel Command and Air Research and Development Command was announced last week by Air Force Secretary Harold E. Talbott.

Talbott said the move was made to improve liaison between AMC and ARDC. He said there are many cases where activities of the two commands overlap and other cases where they leave unfilled gaps.

▶ **AMC Round**—Industry observers interpreted the move as another round for AMC in the continuing battle between the philosophy of quantity represented by AMC and that of quality represented by ARDC.

Since ARDC was split from AMC as a separate command in 1951, there has been pressure from AMC to reverse USAF policy and merge the two activities in a single command.

▶ **Subordinate Status**—Talbott rejected the merger proposals but established Cook as an overall materiel czar to ride herd on both commands. There will be no change in either command.

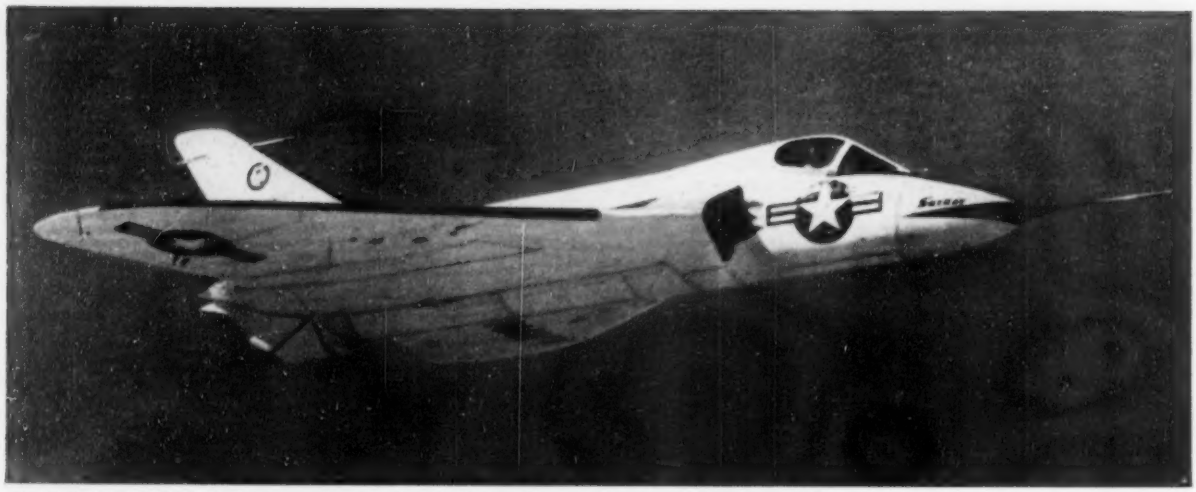
However, Lt. Gen. Laurence C. Craigie, now Deputy Chief of Staff for Development, will lose his independent status on the Air Staff and become subordinate to Gen. Cook.

Working under his new chief, Craigie will be responsible for USAF research and early development activities.

As the projects reach a more advanced state that predicates quantity production, Cook will assume control.

▶ **Industry Victory**—The move also was regarded as a victory for some segments of the aircraft industry who bitterly have opposed the ARDC philosophy of developing complete weapons systems.

They favor the traditional practice preferred by AMC of buying smaller qualitative advances through model improvement rather than the larger qualitative advances sought through weapons system development.



NAVY'S DOUGLAS F4D topped Supermarine Swift, but Skyray's 742.7 mph. was just short of setting a new official speed record.

U.S., Britain Battle for Jet Speed Record

Navy was preparing for another attempt to wrest the world speed record from the British last week with the Douglas F4D Skyray.

First series of speed runs by Lt. Cmdr. James Verdin at Thermal, Calif., earlier in the week saw the F4D post an average of 742.7 mph. This was well over the 737.3-mph. mark set by Mike Lithgow in the Supermarine Swift last week in Libya, but was about 2 mph. short of the 1% margin required for an official record.

The Skyray runs came in the midst of a hot, four-way fight to retain the speed title, with North American and Douglas representing the United States, and Hawker and Vickers carrying the British colors.

▶ **The Records**—Here is the sequence of speed record changes in recent weeks:

- **North American F-86D** piloted by Lt. Col. William Barns, 715.6 mph., July 1953, Salton Sea, Calif.
- **Hawker Hunter,** piloted by Neville Duke, 727.6 mph., Sept. 7, off Sussex, England.
- **Vickers Supermarine Swift,** piloted by Mike Lithgow, 737.3 mph., in the Libyan Desert Sept. 25.
- **Douglas F4D,** piloted by James Verdin, 742.7 mph., Salton Sea, Calif., Sept. 28.

Verdin needed an average of 744.6 mph. to top the Swift mark by the requisite margin. His four runs were clocked at 748.4 and 746.9 mph. for the downwind legs and 740.8 and a disappointing 734.6 on the upwind legs. The slow speed on the fourth pass was explained by a sudden climb for altitude made near the end of the sweep across the course at 100 ft. altitude.

▶ **Gages Dance**—"The engine fluctuated a little," he said later. "The gages did a little dance and I thought I'd better head for some place to land. But it settled down and flew just great. It's a real going machine and it handled nicely."

Verdin made his flights late in the afternoon after the temperature was below 90 deg. Trouble with a Pitot tube that had to be sent back to Douglas factory for repair delayed the second attempt.

Douglas sources predicted that with a 90-100-deg. temperature, the F4D would surpass the Swift mark by sufficient margin. If the Skyray breaks the record, it will become the first carrier-based plane to do so.

The F4D is powered by a Westinghouse X540-WE-8 with afterburner.

▶ **Four Planes Battle**—Meanwhile, the international battle for the speed record, which had been dormant since a Lockheed F-80 brought the record to the U. S. in 1947, was flaring on several new fronts. Both the Hunter and the Swift were scheduled for new attempts in the Libyan Desert where temperatures are running over 100 deg., and USAF announced it would throw the North American F-100 into the fray at Salton Sea as soon as the Navy finished its runs.

USAF and North American are confident the F-100 Super Sabre will bring the record back to the U. S. for a substantial stay. The Super Sabre is powered by a 10,000-lb.-thrust P&WA J57 turbojet and can get about 15,000 lb. thrust for the speed runs by using its afterburner.

▶ **Duke Record**—Duke began the unprecedented speed record assault, that already has seen increases of 42 mph. over the F-86D mark, with a 727.6-mph. performance over the English Channel area in 70-deg. temperature.

Hawker claims Duke's performance reached Mach .94. He flew the Hunter prototype, equipped with a special tapered nose and no armament. The Hunter was powered by a Rolls-Royce R.A. 7 Avon rated at about 7,500 lb. thrust plus afterburning. Hawker reported Duke and the Hunter were en route to Libya for another try in higher air temperatures.

Second boost in the record came from Lithgow in a Supermarine Swift, also powered by an R. A. 7 Avon with afterburner. The Swift was equipped with its normal armament of four 30-mm. cannon and was a production model.

The Swift mark of 737.3 mph. was made in a reported 103-deg. heat in the Libyan Desert. Press despatches from Libya reported the cockpit had to be packed with dry ice to keep the pilot cool during the runs. The F4D and F-100 are equipped with cockpit air conditioning units that automatically adjust inside air temperatures.

▶ **Sonic Goal**—None of the speed runs to date has reached the speed of sound at the temperatures in which they were flown. At standard (59F) temperature, the speed of sound is 735 mph. at sea level, but at 100 deg. it is approximately 790-800 mph.

Meanwhile, there were indications of growing dissatisfaction with the long-outmoded Federation Internationale Aeronautique speed rules which force pilots to fly dangerously low at speeds never anticipated when the rules were made and which measure the performance of the plane in artificial ground-speed instead of Mach number, the real basis for evaluating aircraft performance now.

ACC to Set New National Air Policy

Details on how the Air Coordinating Committee will tackle the job of formulating a new national aviation policy for President Eisenhower will be revealed by Robert B. Murray, Jr., Undersecretary of Commerce for Transportation, in a speech Oct. 13 before the National Defense Transportation Assn. at Louisville, Ky.

Murray is chairman of ACC, which was requested to make the new policy study by President Eisenhower.

▶ **Policies Continue**—Murray told AVIATION WEEK the policy study would not delay aviation policies of the Republican Administration that already were being implemented, such as reduction of federal airport aid, overhauling of the Civil Aeronautics Administration operations, reduction of airline subsidies, etc.

The President's recent request for a new look at national aviation policy confirmed AVIATION WEEK's prediction of Apr. 20 (p. 13) that the Republican Administration planned to re-evaluate the role of the federal government in civil aviation and that key man in this process would be Murray.

In his letter to Murray, the President pointed out that there had not been a broad review of U.S. aviation policies in more than five years, that many events of major significance had occurred in the meantime. The last previous survey was made in 1948 by the presidential commission headed by Thomas K. Finletter and a congressional aviation policy group headed by the then Sen. Owen Brewster and Rep. Carl Hinshaw.

▶ **Expect No Hearings**—Although President Eisenhower's letter to Murray directed that the new policy should be formulated "in consultation with appropriate industry, local government and private aviation groups," Washington observers do not expect the Air Coordinating Committee study to involve open hearings of the type which previously were held by the Finletter commission.

Indications are the ACC will rely on aviation members of two Commerce Department sections—the business and the transport advisory groups. Members of these groups in aviation include: J. H. Carmichael, president, Capital Airlines; Ralph S. Damon, president, Trans World Airlines; Dr. John H. Frederick, University of Maryland; W. A. Patterson, president, United Air Lines; C. R. Smith, president, American Airlines; Juan Trippe, president, Pan American World Airways; Ralph J. Cordiner, president, General Electric Co.; Gen. George C. Marshall; Gwilyn A. Price, president, Westinghouse Electric Corp.; J. Carlton Ward, president, Vitro Corp.

President's Letter

"Dear Mr. Murray:

"The increasing importance of aviation as an instrument of national policy and to our national welfare makes it desirable that there be available to the government agencies, the aviation industry, and the public a clear and comprehensive statement of the aviation policies of this Administration.

"In a field so dynamic as aviation, our policies and programs must be flexible and capable of growth. It has been over five years since a broad review of U. S. aviation policy was completed; many events of major significance have occurred in the interim.

"I therefore request that you, as chairman of the Air Coordinating Committee, direct it to undertake a comprehensive review of our aviation policy and to prepare a statement of present United States policies in the primary areas of aviation interest for my consideration and approval. This should be done in consultation with appropriate industry, local government and private aviation groups.

Sincerely,
Dwight D. Eisenhower"

▶ **ACC Members**—All federal agencies concerned with aviation are represented on ACC and those members are expected to represent their respective government units at policy-making sessions.

In addition to chairman Murray, ACC membership is composed of: Roger Lewis, USAF Assistant Secretary; Earl D. Johnson, Undersecretary of the Army; James H. Smith, Jr., Assistant Secretary of the Navy for Air; Oswald Ryan, CAB chairman; John C. Allen, Assistant Postmaster General; J. Paul Barringer, director of Office of Transport and Communications Policy in the State Department, and H. Chapman Rose, Assistant Secretary of the Treasury.

Non-voting members: Weldon Jones, Budget Bureau, and Alvin C. Barber, Office of Defense Mobilization. Charles O. Cary is executive secretary.

▶ **Before Congress**—The ACC study is expected to deal primarily with civil aviation rather than with the basic strategic aspects of military air power. Its concern with military air power problems probably will be primarily with how they relate to the development of civil aviation facilities, such as the airways system, airports, nonscheduled airlines, and to similar organizations.

It is expected that the study will be completed and transmitted to the President before Congress convenes in January so he will have a policy to guide Republican actions on the variety of aviation issues that will confront the next session of Congress.

Wilson Predicts Little Change in '55 Budget

Defense Department's fiscal 1955 budget will be the same or less than the 1954 budget ($34.4 million), Secretary Charles Wilson predicted last week. Expenditures of about $43 million this year should be less in 1955, he said.

He hastened to add, however, that the review of the military services which the Joint Chiefs of Staff now is completing would determine the budget request. That report is due momentarily.

▶ **Wilson's Optimism**—Highly optimistic about the state of U.S. defense at the moment, Wilson claimed that although we cannot afford to be complacent about the threat of Russian attack, there is no reason to be panicky. The Russians are not interested in fomenting war at the present, he said, adding quickly that that doesn't mean they couldn't.

Wilson bases his optimism, he said, on the fact that the Russians have no better fighter than the MiG which is "greatly overrated" in his opinion. Their best bomber is an improved version of the B-29, he said.

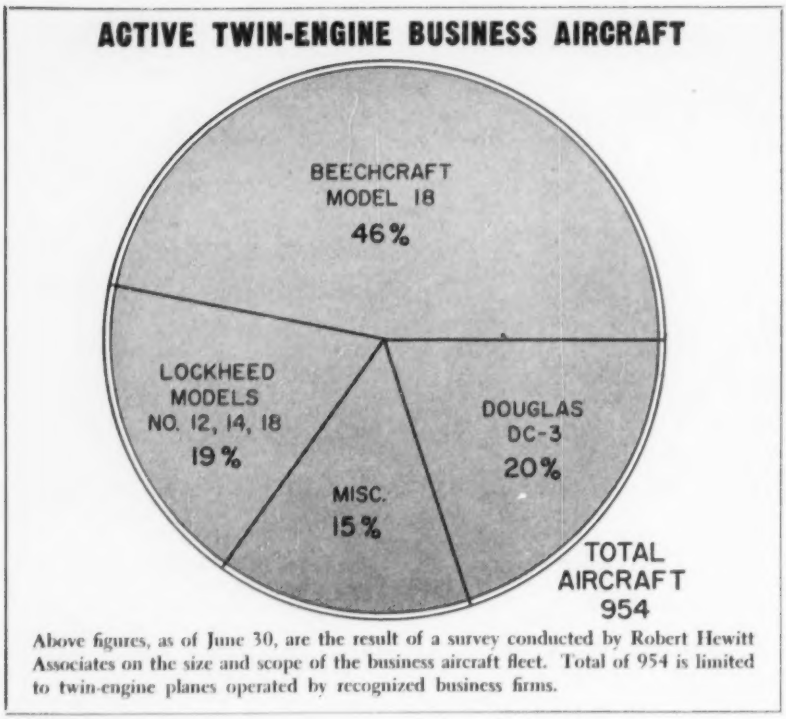
AVIATION WEEK reported Mar. 30 (p. 30) details and pictures of the Russian Il-28 twin-jet bomber which the Soviet is flying in Eastern Europe. A later fighter than the MiG-15 is the La-17, a model of which was pictured in AVIATION WEEK Aug. 24, (p. 16).

If war should come soon, he believes it would come by a "miscalculated error."

▶ **Praises USAF**—The Secretary said it was possible that the Air Force would be built up to 120 wings by the end of fiscal 1954. Air Force Secretary Harold Talbott said only the day previous USAF would probably get to 114 then.

Wilson praised USAF for having the "courage to move" when it found surplus within its operation thus giving it opportunity to order more advanced aircraft. He referred to USAF's recent cutbacks of programmed older aircraft and engines and orders for newer fighters and bombers. By such refining of its program, he explained, USAF is building the "finest air force in the world."

He revealed that USAF is procuring enough support aircraft for 120 wings while it is building toward a total 143-wing Air Force.



Above figures, as of June 30, are the result of a survey conducted by Robert Hewitt Associates on the size and scope of the business aircraft fleet. Total of 954 is limited to twin-engine planes operated by recognized business firms.

Business Flying Gets Data Service

Business flying, the industry that mushroomed overnight after World War II, has had many growing pains in its rapid rise, and reputable information about the field is scarce. A newly organized information service devoted exclusively to corporations operating business aircraft hopes to correct this.

Robert Hewitt Associates, a firm headed by the founder of Mallard Air Service, Inc. and Mallard Industries who long has been an outstanding figure in business flying, is announcing its plans for the service this week.

For the past year, since severing connections with Mallard, Hewitt has conducted an extensive survey of the business aircraft field in relation to the total number of aircraft registered and in operation by U. S. business firms "actively engaged and identified in a specific industry not associated with the business, sales and service of aircraft operation."

▶ **His Definition**—For purposes of the survey and for subsequent analysis, Hewitt considered only twin-engine aircraft. In addition, he applied his own conservative definition of the business or executive aircraft—"a corporation or business organization-owned aircraft, powered by at least two engines, equipped to fly day, night and instruments to transport business personnel, prospects, customers, suppliers and friends in connection with the execution of business duties."

Applying this definition and carefully checking title files, Hewitt came up with figures on the existing business fleet that show a marked contrast to any previously released by other agencies.

Hewitt's findings, as of June 30, reveal a total of 954 twin-engine business aircraft owned by 674 U. S. firms; 517 of these firms own and operate one aircraft, while 157 others operate fleets.

▶ **Basic Types**—Three plane types are most prevalent in the fleet: Beech Aircraft Corp. Model 18, Douglas Aircraft Co. DC-3 and Lockheed Aircraft Corp. Models 12, 14 and 18. Planes built by these three firms presently constitute 85% of total business aircraft in operation, Hewitt says.

In announcing his new service, Hewitt states that "there has long been a need for some sort of central agency in the business aircraft field to provide for exchange of ideas and dissemination of information on common operation problems."

▶ **Reference Manual**—Nucleus of the Hewitt program is a reference manual, designed to provide current information on standard operating procedures used throughout the aviation field, with particular emphasis on business aircraft operations.

Included in the manual will be up-to-date information on all federal and state regulations, written in lay language in order that it may be understood by businessmen with little or no knowledge of aviation, as well as by traffic, flight and maintenance personnel.

Hewitt follows with another guide, designed for specific company needs. Made up for the most part of pertinent extracts from the first manual, the "company manual" is tailored to meet particular problems of individual clients.

▶ **Supplements**—Along with the manuals, the firm offers a supplementary service which consists of additions and revisions as new information and data become available. These include supplements to regulations, safety and accident bulletins, latest manufacturer's data, insurance data and a newsletter.

In addition, Hewitt plans to maintain a reporting service in which all clients will participate. This will be accomplished through the submission of standard forms recording each company's operating procedures.

Hewitt Associates integrate this data, establish an average, then provide the client with a clear-cut picture of his operations as compared to the average and to that of a regional standard.

▶ **To Meet Needs**—The picture includes such items as comparison of wages for operating personnel, indication of depreciation trend and comparison in costs of aircraft utilization, insurance, maintenance, hangar space, passenger services and other operations.

The reporting service also is designed to furnish pertinent information to manufacturers and others in the aircraft industry in order that they may be able to design their products and services better to meet the needs of the business aircraft field.

▶ **Lack of Data**—Business aircraft for the most part have been adaptations of military and airline planes, he says. "Aircraft companies and manufacturing organizations are interested in producing new products for the business fleet, but they have not been able to do so because of a lack of knowledge on their part as to what is wanted and what is needed by the corporate owner. The corporate owner, on the other hand, doesn't possess sufficient knowledge to ascertain his needs properly."

Hewitt feels that at present there is an acute lack of specific collected data which is adequate and accurate enough to aid in the formulation of decisions which are mutually beneficial to owners, operators and manufacturers.

He points out that this information does exist in the hands of individuals and organizations. The problem, he says, is collecting and coordinating it.

By way of initiating the service, the firm, headquartered at 439 Madison Ave., New York City, is embarking on an extensive sales campaign. Letters outlining the program have been sent to some 700 twin-engine aircraft owners with copies for operating personnel.

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Canted Forrestal

- **Navy redesigns its super carrier to new concept.**
- **Essex and Midway types slated for conversion.**

Navy has redesigned its big super carrier, USS Forrestal, to employ the British canted-deck concept. By doing so, Navy claims it saves $3 million.

The decks will be built on the Saratoga, under construction at Brooklyn, N. Y., Navy Yard, and on a third carrier of the Forrestal class, bids for which have not yet been let.

▶**Tested Theory**—Early artist's conceptions of the super carrier erroneously indicated it would have two canted decks.

Actually the carrier was designed before the canted deck was developed. Two abutments one jutting from the starboard and the other from the port side of the Forrestal, were designed for catapulting aircraft. Landings were to be made simultaneously down the center line of the ship.

Now that tests aboard the converted USS Antietam have proved the canted-deck theory to Navy, it is to be built into in all future carriers. Fifteen Essex-class and all Midway-class carriers will be converted.

On the Forrestal, the portside abutment will provide the only canted deck. The abutment on the starboard side will house an elevator.

Landing aircraft will approach at an angle to the ship in a line 118 ft. clear of the new fixed island on the starboard side.

▶**Fixed Island**—Originally the Forrestal-class carrier was designed with an island that retracted along the starboard side of the ship about a third of the way back from the bow.

It was an abbreviated island, containing only the vital electronic equipment and a cramped captain's bridge.

Other normal island equipment was housed below the flight deck, placing the gear in two different locations and complicating the carrier's operation.

The canted-deck carrier has proved that control islands in the normal position create no hazard for landing aircraft.

Therefore, the Navy will build a compact stationary island on the starboard side amidships.

It will contain all of the radar and electronics gear, smoke pipes, captain's sea cabin and flag quarters. The island will be a somewhat shorter and fatter installation than on conventional carriers.

There will be sufficient space between the island and the starboard edge of the flight deck to park aircraft or warm them up for takeoff.

▶**Four Catapults**—Another change made by the new design will be the transfer of one catapult from the starboard abutment to the port side, putting two catapults on the port abutment. These are the smaller C-11 British-type steam catapults.

Two larger C-7 steam catapults, U. S. version of the British development for launching heavier-type aircraft such as the Douglas A3D, will be installed on the bow of the flight deck.

▶**More Space**—Elevators are to be rearranged so that there will be one fore and one aft of the island. Elevators also will be built in the port abutment and on the stern, as originally designed.

Eight smokestacks located amidships, four on each side, have been moved to the after section of the island where they normally are placed. This removes complications above deck with jutting stacks along the sides and the intricate plumbing below the flight deck needed for the original stack arrangements.

With the design, Navy figures the super carrier will gain space on both the hangar and flight decks to accommodate more than 100 jet fighters and bombers that it can hold and will become more flexible in operation.

Navy emphasizes that the change at this point will not delay construction of the Forrestal, now well underway at Newport News, Va.

The 75,000-ton carrier is expected to be completed by late 1954. The Saratoga is due in 1955, and the third super carrier in 1956. Each should take about 34 months to build.

ATA Reports on Nonsked Business

An Air Transport Assn. report reveals that nonsked airlines now fly 7 to 8% of total domestic passenger-miles. The annual statistical study on nonskeds by the scheduled airlines' association also reports:

• **North American Airlines,** nonsked "syndicate," flies nearly 2% of total domestic scheduled and nonsked passenger-miles and one-third of domestic nonsked business. The report also shows that North American relies almost entirely on civilian trade, whereas the 56 other domestic nonskeds in 1952 did 35% of their business in official military traffic.

• **Four big overseas nonskeds**—Overseas National Seaboard & Western, Transocean and U. S. Overseas together take in 46% of all nonsked transportation revenues, largely on military charters. Of the $71-million total nonsked trans-

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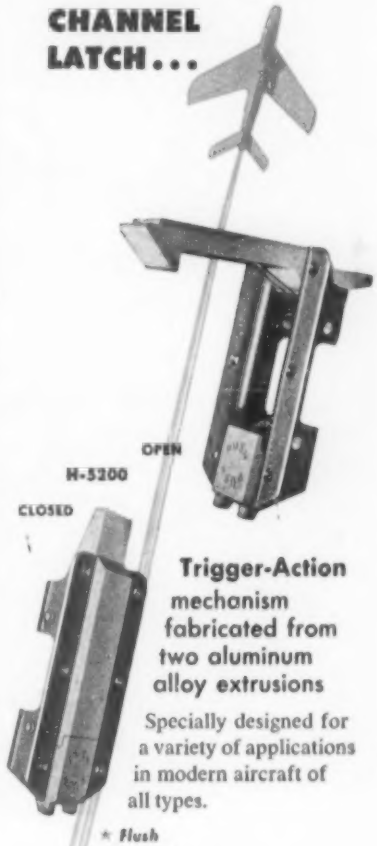

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Bracket is made of standard 302 stainless steel sheet stock and actuating springs of music wire cadmium plated for rust resistance.

Installation cut-out is made in the form of a simple rectangular slot and mounting the latch is accomplished by fastening bracket with six rivets to door structure.

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Nonsked Share

Domestic Traffic

	Passenger Miles (millions)	% of Total
Trunklines (scheduled) ..	12,121	92
North American.	232	2
56 other nonskeds	730	6
Total	13,083	100

Source—Air Transport Assn.

port revenues reported for 1952, this irregular "Big Four Overseas" took in $33 million. North American $8 million, the remaining 56 carriers $30 million. Trunkline revenues in 1952 were $768 million.

• **Nonsked route pattern** within the U. S. "closely approximates the high-density routes of the domestic trunk airlines."

• **Fleet of 137 nonsked planes** in 1952 compares with 179 planes in 1949. Official figures show one-fourth of these planes were owned by the lines, the rest leased.

However, transport ownership proportion is actually higher. Some airline owners also own planes under a different company name and, in effect, lease planes to their own airlines.

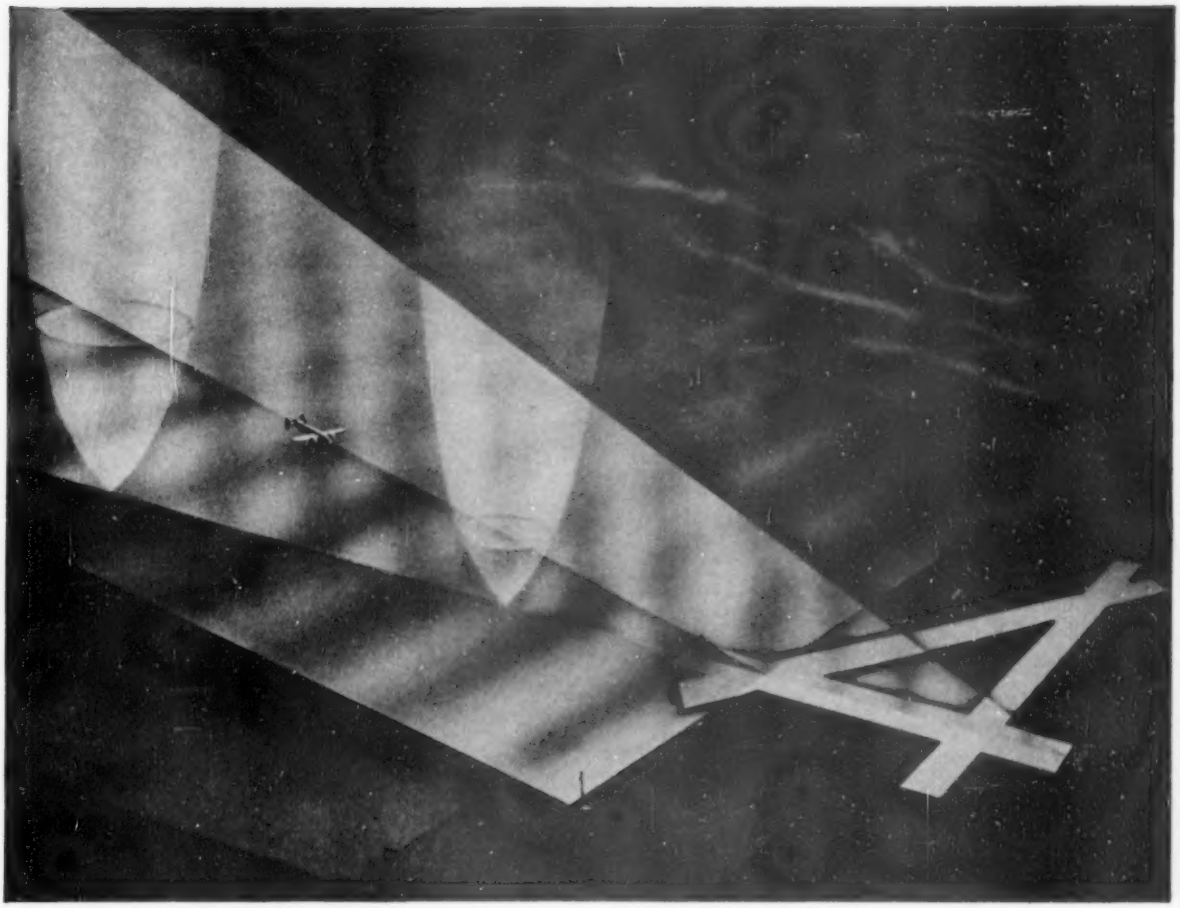
The 1952 fleet was composed of 63 C-46s, 31 DC-3s, two C-47s, 16 DC-4s, 16 C-54s, one L-12, one Constellation, one DC-4B, one DC-6B and five Martin 2-0-2s.

• **Profits and losses** reported to CAB give a distorted picture of the nonsked industry, ATA says. Official reports, totted up in the ATA study, show a total $325,000 loss for the 56 smaller domestic nonskeds and a $158,000 loss for North American. Actually, some nonsked carrier owners also have equity in sales agencies and aircraft-owning companies that lease to their own and other carriers. Their profits in these enterprises are not required to be reported to CAB.

The "Big Four Overseas" nonskeds, however, do not operate this way to as great an extent as the smaller irregulars. Their over-all profits are reported at $7.5 million for 1952.

LAI Resumes German Service

Rome—Linee Aeree Italiane has resumed service to Germany after a lapse of nearly 10 years. The carrier flies from Treviso to Frankfurt-Am-Main three times weekly with Convair 240s. Trans World Airlines, part owner of LAI, handles passenger and cargo booking for the Italian air carrier's flights in Germany.



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National Reports Peak Revenues

New peaks in National Airlines revenues and earnings plus a strengthening of its financial position is revealed by the carrier's annual report for the year ended June 30, 1953.

This account may be a forecast of results to be reported by other major airlines for the 1953 calendar year.

▶ **Delta-C&S Report**—National and Delta-C&S Air Lines are the only trunklines reporting on a fiscal year basis.

Delta-C&S recently issued a preliminary unaudited report for this past 12-month period showing a net profit after taxes of $1.4 million plus nearly $2.8 million in "special items" for a total of $4.2 million.

Comparative analysis with the previous year is not possible without the actual annual report and disclosure of the properties forming this newly merged airline.

▶ **Record Revenues**—National reports record total operating revenues of more than $32.9 million for fiscal 1953 (Aviation Week Sept. 7, p. 7), up 16.5% over the previous year and representing a formidable gain of 317% during a five-year period.

Net operating profit after income taxes was $2 million, representing an increase of $446,884 or 28% over the previous year.

Non-operating profits, largely derived through gains realized from the sale of equipment, aggregated $1,963,086 after capital gains taxes of 26%.

All told, this gave National a net profit of more than $4 million, or $3.99 per share for fiscal 1953, compared to $2 million or $2.05 per share for the 1952 period.

▶ **Tourist Gain**—Passenger revenues accounted for more than $29 million or 88.6% of total revenues. Coach traffic increased 80% during the past year, accounting for the decrease in the average yield per passenger mile to 5.16 cents from 5.48 cents for fiscal 1952 period.

Management asserts that "operations during the past fiscal year have demonstrated that low-cost coach service is economically justified." This activity accounted for 42.4% of the company's total passenger service during this past fiscal year.

Presumably even larger revenues and earnings could have been developed if greater capacity had been available when first anticipated.

The company says failure of Douglas Aircraft Co. to meet delivery schedules for the new DC-6B in the second quarter deprived National of 159 aircraft days of operation.

▶ **Boosted Equity**—The strongest financial position in its history is evidenced in National's accounts of June 30. At that date, working capital amounted to $6.3 million, up from $4.2 million reported a year earlier.

Continuous re-investment of the bulk of earnings has boosted the equity of stockholders. At June 30, net worth amounted to $14 million or $13.85 per share, compared with $10.40 per share a year earlier and only $6.20 for 1949.

▶ **$12-Million Loan**—To help finance a $21-million new equipment acquisition program, National obtained a $12-million unsecured loan at a 3½% interest rate last October. The nature of the loan and the rate is a favorable reflection in the light of the then prevailing conditions in the money markets. When this loan originally was drawn, the carrier's debt ratio at Oct. 31, 1952, was 53.5%, its highest point. At June 30, 1953, this debt ratio was

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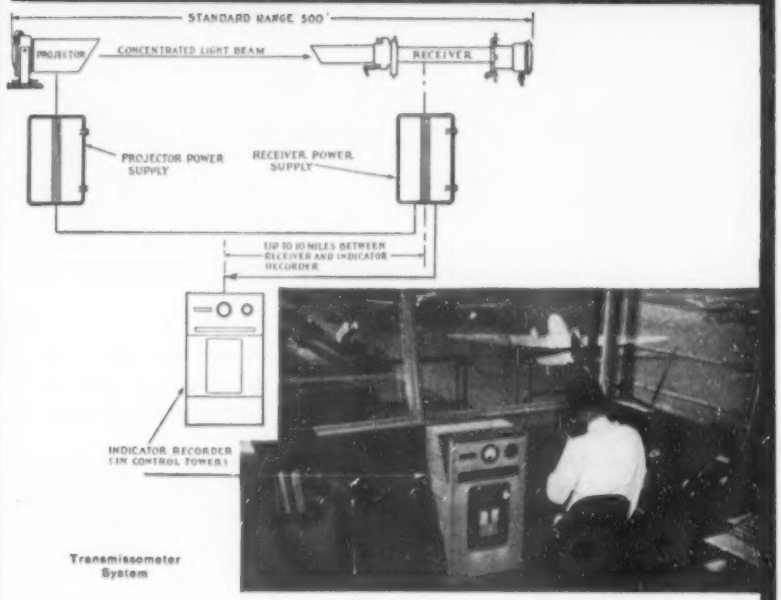
research and development engineers cooperate in producing the latest

"weather measuring" equipment



The new **Transmissometer** takes the guess work out of measuring airport approachway visibility conditions. The fundamental electric design was developed by the National Bureau of Standards. Crouse-Hinds engineers adapted it to the requirements of production processes.

A projector sends a beam of light 500 feet to a photoelectric receiver where it is transformed into an electronic signal and transmitted to an indicator-recorder in the control tower. The tower can be located as far as 10 miles from the runway.

Crouse-Hinds **Automatic Ceilometer** Projector & Receiver System accurately measures the height of cloud ceilings above the earth at any time of day or night. The electrical system was developed by the U. S. Weather Bureau and Crouse-Hinds engineers cooperated in developing it for production.

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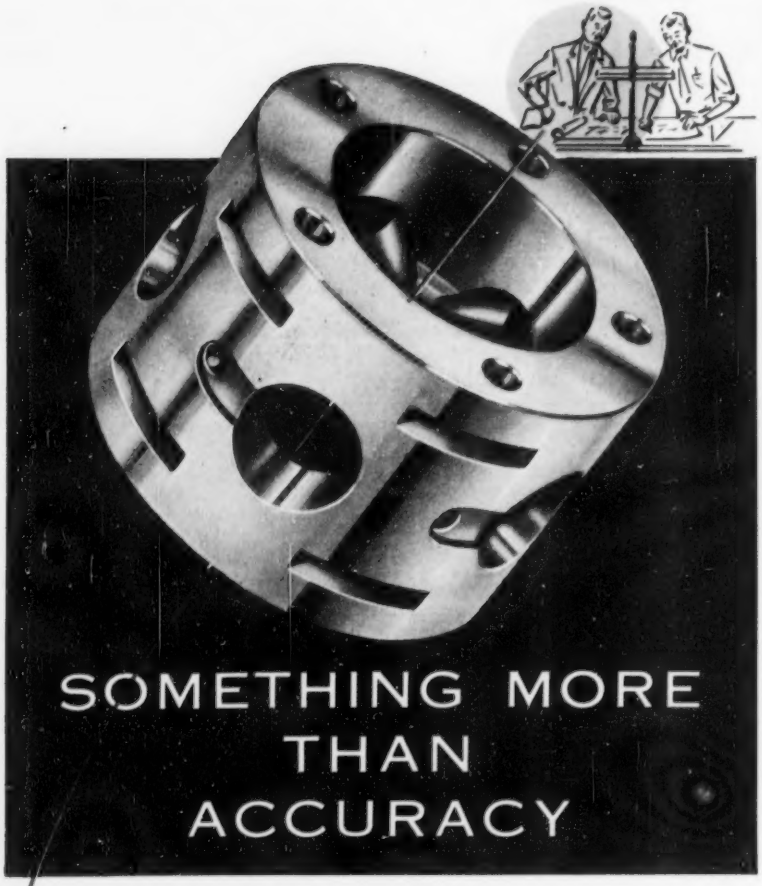

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reduced to 46.2%. It will be reduced correspondingly as earnings augment the equity.

Substantial reductions in debt are scheduled to start Mar. 31, 1954, with quarterly repayments of the bank loan over a five-and-a-half-year period.

With each quarterly repayment, the debt ratio will be reduced progressively and the equity position correspondingly improved.

▶ **Fleet Transition**—Major transitions in National's equipment fleet are being effected:

• **Eight new DC-6Bs** were delivered during the year.

• **Eight Convair 340s** are scheduled to be delivered this calendar year.

• **Four DC-7s** are on order, with deliveries anticipated starting in October.

What this will do to the company's capacity is indicated by management's estimate that, with the completion of all aircraft deliveries on order, National will be able to increase its production to more than 1,250,000 available seat-miles a day during the coming winter season.

This would represent an approximate increase of 39% over the same winter period of the previous fiscal year.

Supplementing the new equipment recently received and to be delivered are six DC-6s, three DC-4s and 11 Lodestars.

During the past fiscal year, material capital gains were realized largely through the sale of three DC-4s and 10 spare DC-4 engines with an additional increment from the net insurance proceeds accruing from the loss of a DC-6. It is presumed that one or all of the remaining DC-4s may be sold.

▶ **Airfreight & Mail**—National, in addition to American, United and Capital, formally has offered to carry first-class mail for the Post Office on an experimental basis.

The carrier proposes to carry this mail at the same rates and charges and in the same manner as airfreight, subject to Civil Aeronautics Board approval. "It is believed that this proposal will be accepted by the Post Office Department with the result that a very large volume of mail will be carried as airfreight," the company says.

▶ **Subsidy Independence**—More tangible and an accomplished fact is National's independence from mail subsidies.

The company in recent years has been receiving a compensatory rate of 53 cents a ton-mile with revenues from this source accounting for 2.17% of total fiscal 1953 revenues, lowest percentage yet from this source.

This compares with 2.5% for fiscal 1952 and 7.1% for 1951. In 1942, 39.7% of all revenues came from mail pay.

—Selig Altschul

Can you see the BIG difference?

On the face of it, Avien's Two-Unit Fuel Gage looks like previous systems, but there's a big and important difference behind it all.

Behind this Avien dial face (shown here three times actual size) is Avien's brand-new concept of fuel gage system "packaging."

Previously, you'd find these units behind a dial: an indicator case, motor and balancing potentiometer; and elsewhere a bridge-amplifier, a shockmount and a tank unit.

Now, in the Avien Two-Unit Gage, the necessary components for the bridge and amplifier functions have been built right into the indicator case.

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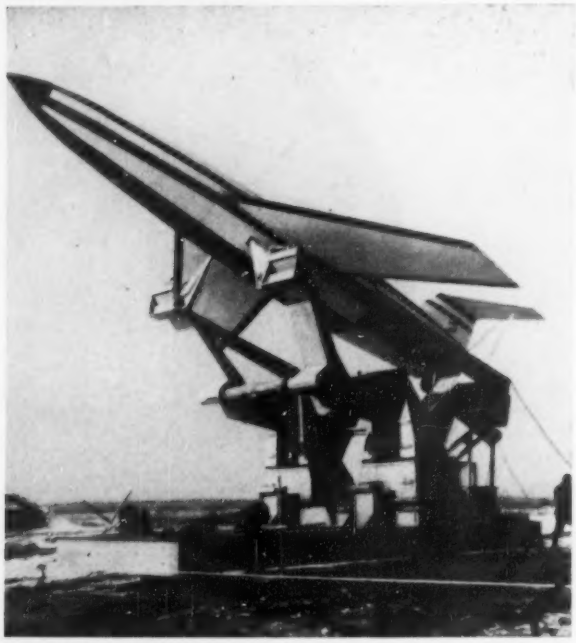
PRODUCTION VERSION of Martin Matador incorporates castings and metal bonding to make manufacturing easier and quicker.



WOODEN MODEL was used to check missile's zero-length launch characteristics. Note midwing design; B-61 has high wing.

Matador Prompts Fresh Look at Design

A missile is a one-shot affair. That means you want simplicity and producibility. Here's how Martin meets those needs in B-61.

By Irving Stone

Baltimore—The guided missile is a one-shot vehicle. Therefore it accents design simplicity and rapid and inexpensive production more than the conventional military aircraft does. It calls for a new look at design concepts, materials and production methods.

A pattern in this new approach has been established in the evolution of the Matador—the pilotless B-61 bomber designed and built by The Glenn L. Martin Co.

Despite its bomber designation, Matador is a surface-to-surface missile—the first production missile of its kind. This production status makes it an important unit in this country's missile group, which embraces a wide scope of design and production thinking.

▶ **Key Considerations**—Basic philosophy behind designing for production was to do a maximum amount of work in subassembly and to have a minimum of detail parts.

Castings rather than forgings were used to avoid potential bottlenecks.

Use of non-critical materials was stressed—resulting in considerable use of magnesium.

The Matador wing and tail, particularly, highlight the simple design and high producibility required for a one-shot aerial vehicle. Application of castings and adhesive metal bonding in these parts is a key point in the desired high-producibility makeup of the missile.

The engineers had to design specifically for adhesives from scratch, consider tooling requirements and associated problems in laying out the basic structure. If bonding were to be used at all, it had to be used in a big way, they reasoned. Little advantage would be gained if the combination of conventional assemblies and bonding were not kept to an absolute minimum.

How well Martin succeeded in carrying out this reasoning is seen from study of the wing and tail makeup.

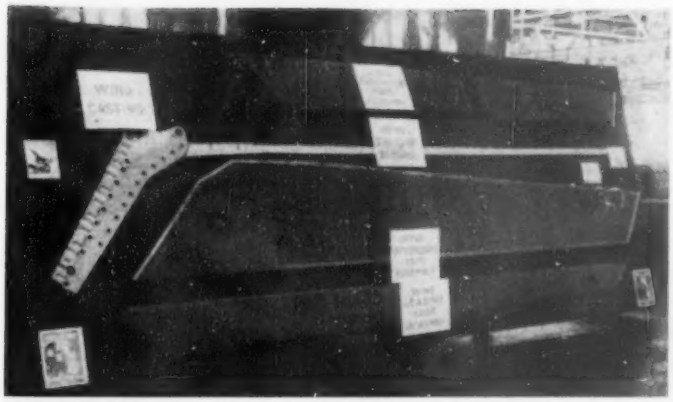
▶ **Wing Construction**—The wing incorporates aluminum honeycomb slabs extending between upper and lower skins.

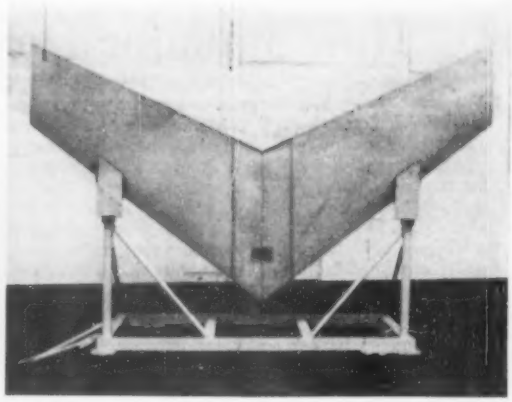
Preparation of the honeycomb core material is a fast operation. Slabs are contoured by a special, semi-automatic tool, utilizing a high-speed bandsaw for cutting the slabs to shape. Originally one rough cut and then a finish pass were required to produce the contoured honeycomb sections, but now the contouring is done in a single pass of the material past the bandsaw.

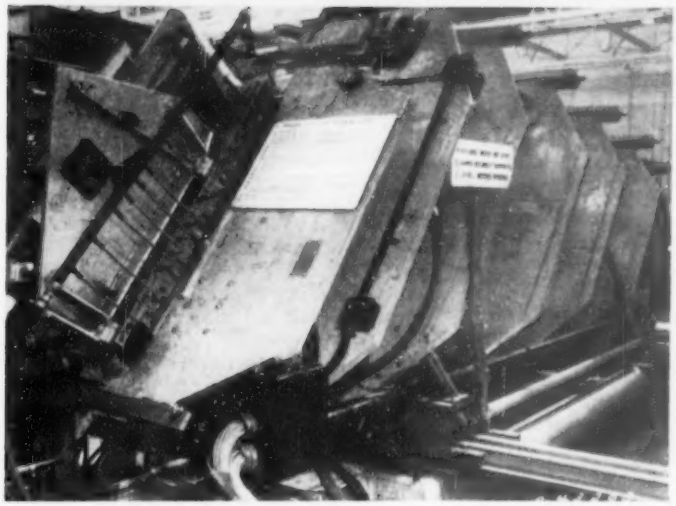
Four of the honeycomb sections are used in the center box core, which extends from the 20% chordline to the 70% point. Honeycomb core material is also used in the leading and trailing edge assemblies. Core sections are metal-bonded to each other and to the covering skins.

Only one type of metal-bonding adhesive—Bloomingdale Rubber Co.'s FM-47 compound—is used in "glued" portions of the Matador structure. This feature also simplifies production procedures.

The necessity for using tapered sheets was avoided by using regular skins of varying thickness, laminated along the span of the wing box section







WING COMPONENTS and center splice casting (top photo) are bonded into wing panel by single tool (bottom). Splice castings are then bolted together to form wing.

STABILIZER uses honeycomb structure, same as wing. It is made as a unit in single operation by single tool, similar to wing tool.

from root to tip. Thus there are three sections of different-thickness skins metal-bonded to each other as well as to the box section honeycomb core.

This type of metal-bonded structure has been used advantageously by European airframe builders—Fokker has used it in spars. Bristol has used it in copter fuselage skins and in wing bulkheads on the Britannia (AVIATION WEEK Apr. 6, p.48).

▶**Center Splice Casting**—Connection of wing panel to wing panel is accomplished with two large center splice castings. The wing skin of each panel is bonded to the casting's as-cast surface. This is the most satisfactory means of holding the wing to the center splice casting.

In the early development stages of the service-test bonded structure, the adhesive was used only on the skin-to-skin and skin-to-core attachment. Bolts were used to fasten the skin to the center splice casting on the wing and rivets were used for the same job on the stabilizer. This mechanical-fastening arrangement involved additional assembly steps and boosted the weight. Thus, if bolts were used for attaching the skins to the center splice casting it would require 425 of these units in drilled and tapped holes.

This obviously would mean a tremendous amount of additional production hours, space and tools. These considerations prompted the switch to the production step of bonding the skins to the center splice casting. In addition to cost, time and space saving, a major advantage of this procedure is that the operation required to complete the skin-to-casting bond involves no more steps than if this were not done—in effect, the bond is a "for free" when the bonding is done on the rest of the structure.

▶**Bonding Sequence**—Wing components are bonded together in a final operation in an ingenious fixture which applies heat and pressure. Heat is applied by resistance wires embedded in a rubber blanket backed up by an air bag for application of pressure. Skin-to-skin and skin-to-casting bonding pressure is many times that required to effect a bond of skin-to-honeycomb core.

In sequence, the leading edge and trailing edge cores are bonded to their skins as subassemblies. The center box core (intermediate core) is attached to the leading edge core. These are then positioned in the final bonding fixture. Next, the center splice casting is positioned in the tool. The center box skins are then positioned in relation to the casting, leading edge and trailing edge skins. The entire assembly is then bonded together to give the complete panel.

This procedure permits a high rate of wing panel production with only one final-assembly tool.

▶**Logistics Consideration**—The wing panels are joined by mating the center splice casting with tension bolts. This arrangement is used to insure easy handling and shipping—an important logistics consideration. This joining scheme introduces part of the casting's weight together with that of the splice bolts as a penalty. This penalty could be avoided if the entire wing were

How Matador Developed

Specifications for the Matador's mission were laid down in 1946, when the military was trying to stimulate interest in the industry for guided missile development.

The specifications given to Martin—one of a number of various mission types laid down at that time—was for a medium-range, surface-to-surface missile (SSM).

Martin engineers studied a number of missile-powerplant-guidance combinations to arrive at a most favorable system. In this choice of combination, Martin was encouraged to exercise a free hand. This was a deviation from past practice as established for conventional aircraft, and pointed to a policy of stimulating systems-engineering on the part of the prime contractor. Aim of this centering of responsibility was to promote early availability of a production tactical missile.

ZERO-LENGTH LAUNCH

One of the early observations was that the launching means would be one of the more difficult phases of the missile development. A zero-length (no ground run) launching arrangement finally was chosen because of its tactical superiority.

It is claimed that this was the first time this type of launching was applied to a flight vehicle.

In 1947, Martin built 10 dynamically similar, full-scale, wooden flight-dummies of the missile and one non-roadable launching platform to prove the theory of the zero-length launch. The success of this method as established for the Matador is indicated by its adoption for similar missiles in the industry.

The Rato bottle used in the launch scheme—a 40,000- to 45,000-lb.-thrust, 2-sec.-duration unit—literally hurled the model into the air. The big problem was to confirm the theoretical calculations of flight trajectory performance with respect to rocket misalignment. Aim was to get the thrust axis of the rocket through the missile's center of gravity.

FLIGHT TESTS

After several successful flights (ground range, 1,800-2,100 ft.) intentional misalignments of the rocket's axis were made to determine off-tolerances permissible.

The first seven model-firings pretty much established the engineering validity of the missile configuration and its launching capabilities. Five of these flights were on the heavily instrumented rocket firing range at Aberdeen Proving Grounds, to check the trajectory with exactness. Two flight tests also were made at the Martin Airport, followed by confirming shoots at Holloman, for range indoctrination.

Concurrently with the 10 dynamically similar models, Martin built 15 experimental (XSSM) versions with adequate, readily available components modified to suit requirements. These components were not the ultimate desired, but Martin wanted to get a missile into the air quickly to uncover the big, basic problems.

These 15 experimental articles were flown at Holloman in 1949-1950. The configuration of the missile was aerodynamically similar to Martin's XB-51.

ROLE OF AVIONICS

Meanwhile, development of the guidance systems for the missile was under way, with a B-29 being used as a carrier. These guidance systems were introduced at the tail end of the experimental flight-test program, which previously had been conducted by command-radio control from a chase plane and a ground station.

Development of the guidance systems was brought about by setting up a new, broad phase in Martin's engineering activities. In 1946-47, company feelers showed that the avionics industry was not inclined to take on the development of the guidance systems in limited, military quantity.

Martin took on the job itself. It pulled into the organization a large number of avionic engineers to work up the required systems. This was the first time this category of engineering talent was brought into the Martin organization in quantity—to supply an important "missing link" for the establishment of a complete-weapon capability.

This situation was not limited to Martin—it was also being instituted in industry organizations with problems similar to Martin's.

The job of blending this "new breed" of engineering technology with established engineering categories called for a new coordinating approach—the use of systems engineers, who would be required to integrate the activities of the various technical specialties, from aerodynamics right on down the list.

INTO PRODUCTION

Service flights with the YSSM article were begun at Holloman in 1950, then were continued at Patrick AFB in 1951 and 1952. Results indicated the feasibility of going into full-scale production .

Engineering redesign for high-quantity production had been begun back in 1951. The latter part of the service-test flight program was devoted to proving some of the engineering changes anticipated for production. For example, an all-movable stabilizer was introduced, instead of the fixed-stabilizer-and-elevator combination, to provide greater pitch control.

First flight of a production model was in November 1952—less than one year after complete engineering release in December 1951.

made in one piece, but logistics considerations were controlling.

Wing tip closure is accomplished with a simple, wooden rib.

▶ **Stabilizer, Fin**—The stabilizer is a simple honeycomb-core structure bonded to a single-piece skin bent to airfoil contour at the nose section. Right- and left-hand panels have skins bonded to the as-cast surfaces of a single-piece center aluminum casting.

The entire metal-to-metal bonding operation on the stabilizer is accomplished in a single heat- and pressure-cycle requiring only a relatively short time.

The fin leading and trailing edge assemblies also incorporate honeycomb construction and are attached to the center fin structure by metal-to-metal bonding. Here again, the core-to-skin and skin-to-center fin structure joining is all done in one operation.

The fin center section has a sheet metal front spar, casting-and-sheet center spar, and a cast rear spar for attachment to the stabilizer hinge point.

▶ **Bonding Steps**—Key considerations in the general bonding process are as follows:

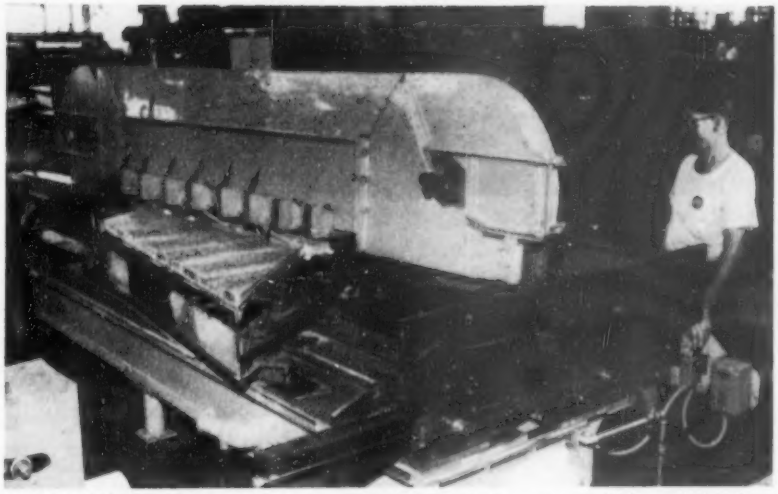
- **Cleaning** of the sheet for cast parts by anodic or chromic-sulphuric bath. The honeycomb core is left relatively clean from the bandsaw cut.
- **Drying** is an important consideration.
- **As soon as possible after drying,** the material is sprayed with adhesive.
- **Spraying is followed** by force-drying for 1 hr. at 225F to remove some of the solvents in the adhesive.
- **Bonding cycle** consists primarily of getting the glue lines to 300F (minimum) for ½ hr., with 100 psi. on the metal-to-metal surfaces and 15 psi. on skin-to-core applications.

Flat metal-to-metal bonding can be done in ordinary plywood press. Over the top of the work (between it and the upper press head) a layer of "Press-to-Flow" is used to give uniform pressure distribution. The same type of press can be used for flat honeycomb panels.

On honeycomb the adhesive is roller-coated on the core. The material is dried for 2 hr. at room temperature in a ventilated room. The skin for covering the honeycomb is sprayed and then covered with a sheet of adhesive film.

Because inspection of the finished article is limited, process control is of primary importance. In the bonding cycle, skin external temperature is checked by having temperature plotted against time automatically. Pressure values also are closely watched.

Inspection check of the glue line on critical metal-to-metal joints is done by cutting a number of ⅛-in. "buttons" out of the lamination. This is done on every production wing panel as well as on the stabilizer. The button can also



HONEYCOMB CORE material is contoured in single pass on highspeed bandsaw.

be used for a qualitative shear evaluation on the glue line.

There is no evidence that there have been any operational difficulties stemming from the bonded construction.

▶ **Fuselage Features**—As in conventional aircraft, the Matador's fuselage is broken down into three sections—nose, center section and tailcone.

Magnesium is used to a considerable extent in both the center section and the tailcone. According to a released photograph, the magnesium applications appear to be in the form of skin (page 28, left-hand picture).

The photograph also shows what appears to be an air intake opening in the belly skin of the center section's aft portion. It appears as if the belly skin forms a portion of the air intake duct feeding the missile's prime powerplant —an Allison J33-A-37.

Forward of the air intake opening, the belly skin reveals what appears as a large removable panel—obviously for equipment, since there is no space in the wing to accommodate it.

▶ **Bottle Dropping**—Release of the Rato bottle—used for the powerful push in the Matador's zero-length launch—is accomplished without any mechanical linkage or other actuating devices.

Support is by two simple fittings and the bottle is held in close contact with them during flight by the Rato thrust. With propellant burnout, the thrust disappears and this lack of force allows the bottle to drop away from the tailcone by air stream pressure.

▶ **Interchangeability**—As would be expected with a vehicle where groundhandling can pose troublesome damage problems, the Matador design has effectively stressed the vital consideration of components interchangeability.

The missile is designed so that it may be broken down into seven basic components for easy handling and shipment. All the airframe parts involved—wing, stabilizer, fin, tailcone, center section and nose section—are interchangeable. This philosophy of interchangeability also has been extended to functional components as well.

ITALIANS TEST NEW PERSONAL PLANE

Initial flight tests of the new Piaggio P. 149 Tourer four-place personal plane are progressing satisfactorily, according to the maker. Aircraft is a private version of the P. 149 trainer produced for the Italian air force. It differs from the military model in having tricycle landing gear. Note the three-blade propeller, of Piaggio design. Powered by a Lycoming GO-435-C2 of 260 hp., the P. 149 Tourer grosses 3,100 lb. and cruises at 162.5 mph. at 3,280 ft. on 65% power. Range is 500 mi.

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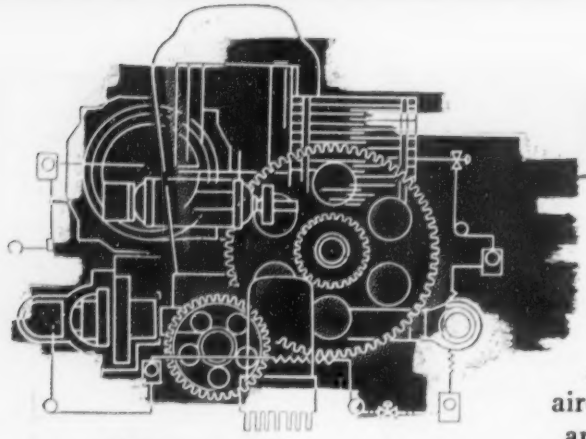

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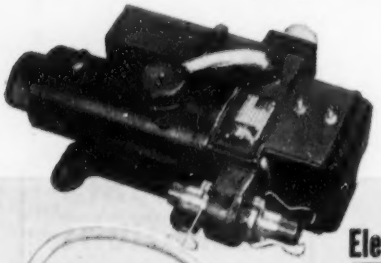

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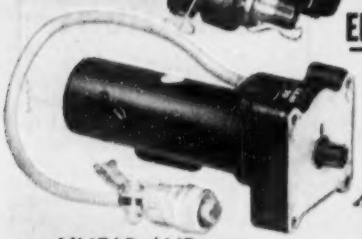

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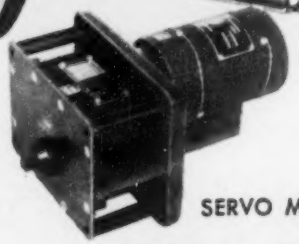

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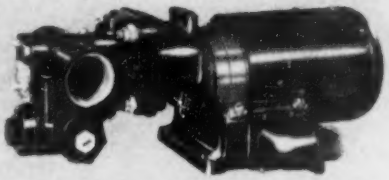

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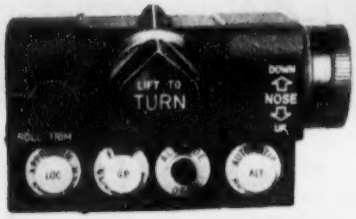

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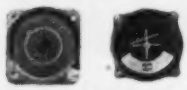

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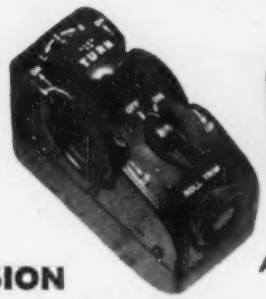

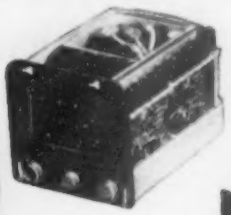

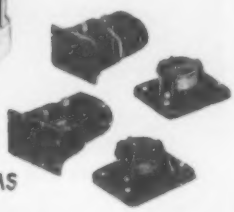

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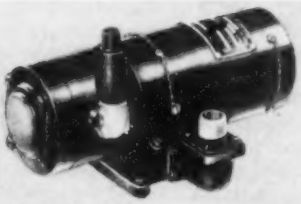

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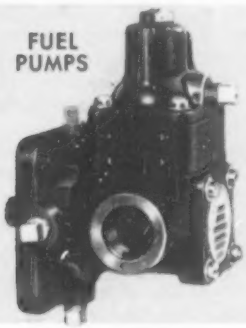

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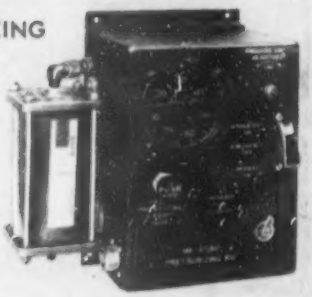

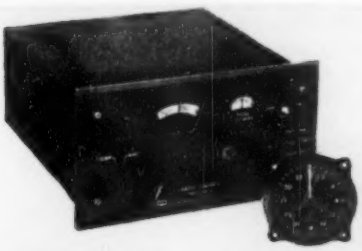

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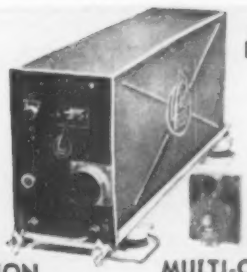

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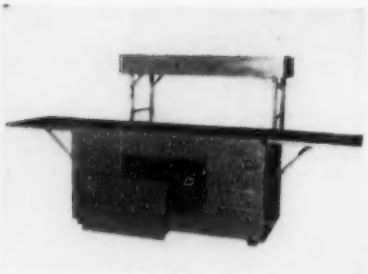

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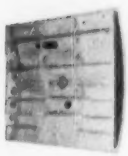

Cargo Hatch, one of 23 products manufactured by REF for Grumman's "Albatross" Rescue Ship and "Cougar" Jets.

Manufacturers of

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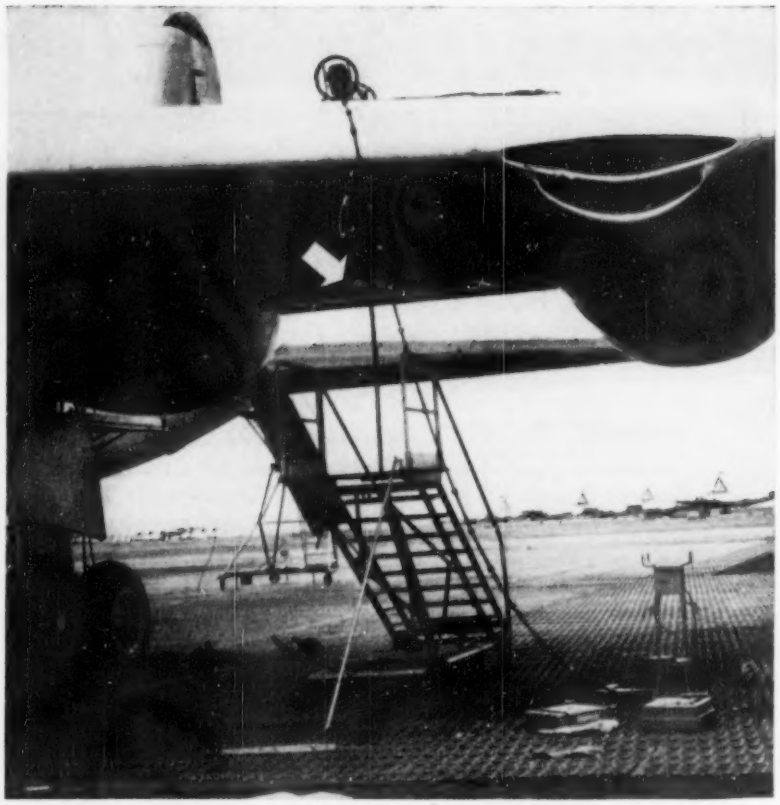


AIREX kit X-rays B-36 wing for defects. Arrow points to film under wing.

X-Rays Pinpoint Aircraft Defects

The use of X-ray inspection for spotting defects in aircraft components, without need for disassembly, is seen offering appreciable benefits in maintenance activities.

Interest in the method has already been shown by airlines and an airframe builder. Also, the procedure has been tried on military planes and the Air Force is now acquiring several of the X-ray inspection units.

▶ **Portable**—A new company—Airex Inspection Service, headed by Ralph Parker, and located at San Francisco Airport—is offering the X-ray inspection method, reported to be the first procedure of its kind certificated by the Civil Aeronautics Administration for aircraft maintenance. Certification was granted by CAA late last March.

Airex uses Danish-made Andrex X-ray equipment. It weighs 305 lb. complete and can be hauled in the trunk compartment of an automobile. Its portability makes it available for field service. Its use for aircraft maintenance jobs is claimed to offer appreciable time and labor savings by permitting inspection of critical areas without disassembly.

▶ **AF Use**—First important test of this inspection service was at Carswell AFB, Texas after a disastrous tornado hit the field last fall. Parker offered the service to the Air Force for the examination of planes which did not show external damage. About 30 X-ray shots were taken for each plane. Sheared rivets, buckled and cracked structural members were revealed. Wright Field officials used this Carswell work as a service test.

Most recent AF use of the procedure was on a B-47 after a rough landing of the craft at Tinker AFB. Minor wrinkles in the fuselage skin were the only external signs of damage, but a radiograph of the section adjacent to the landing gear showed sheared rivets and other damage.

▶ **Airline, Lockheed Use**—American Airlines was the first to ask for X-ray shots—Parker was doing some work for the line in Tulsa when the tornado hit Carswell.

Both United Air Lines and Pan American World Airways are doing exploratory work with Airex at the San Francisco airport.

United's inspection department expects to employ the instrument as part of its maintenance routine, and is finding use for its capabilities in structural inspection. Pan American is currently running tests on the tool's use in ex-

First Full Radar Traffic Control Solves Bad Weather Jams at Washington National Airport*

Gilfillan ASR-1 and PAR-1 at Washington National Airport

Credit for developing the successful radar procedure at Washington National Airport goes to CAA and a special Traffic Control Committee including representatives of Air Transport Association, Airline Pilots Association, Air Force, Navy and Coast Guard. Gilfillan is proud of the part Gilfillan GCA plays in this achievement.

RESULTS OF FULL RADAR TRAFFIC CONTROL OVER 6-MONTH PERIOD

- IFR capacity of airport doubled.
- Traffic delays due to weather cut ⅔.
- "Stacking" practically eliminated.
- Departure delays cut from maximum of 2 hours to 10 minutes.
- Delays due to missed approaches or lost aircraft virtually eliminated.
- Time required to unsnarl wholesale shifts from VFR to IFR flight plans materially reduced.
- Safety of terminal-area traffic increased.

* (As reported in Aviation Week)

OPERATIONAL STATISTICS

(Covering 2-month bad-weather period during winters of 1952 and 1953)

1952, WITHOUT RADAR: 2,239 IFR operations. Traffic delay 76 hr. 58 min.

1953, WITH RADAR: 5,570 IFR operations. Traffic delay: 9 hr. 9 min.

GENERAL MILTON ARNOLD, ATA Vice-President for Operations, said that radar traffic control permits airline IFR operations at virtually the same capacity as VFR and has shifted the airline operating bottleneck from the air to the ground.

RADAR EQUIPMENT

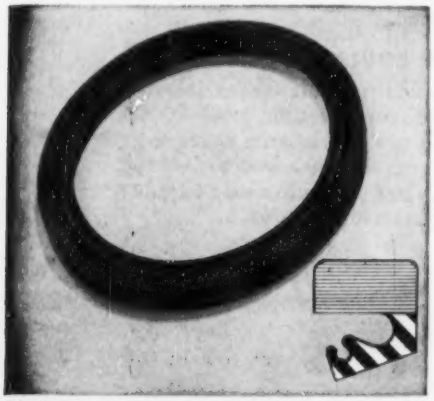
LONG RANGE (100-MILE) RADAR to guide air traffic to four major approach fixes.

GILFILLAN GCA SURVEILLANCE RADAR to guide air traffic from approach fixes to final approach.

GILFILLAN GCA PRECISION RADAR to guide air traffic on final approach.

J-M Clipper Seals fly with the Sikorsky HO5S helicopter...

Clipper Seal being installed in the intermediate gear box of the Sikorsky HO5S helicopter to seal oil in, keep abrasives out.



Photograph and cross section of Type LPD Clipper Seal. This is just one of numerous styles available to solve tough sealing problems.

...seal oil in, keep abrasives out, at critical locations

To retain the lubricants vital to its complex rotor and gear systems . . . and to protect bearings against the infiltration of abrasives . . . the new Sikorsky HO5S helicopter depends on these positive sealing qualities of Johns-Manville Clipper Seals.

Clipper Seals are flexible—molded of special compounds, they have a tough, dense heel and a soft flexible lip concentrically molded into one piece.

Clipper Seals reduce friction—A specially designed garter spring holds the lip in tight but firm contact with the shaft. Thus a positive seal is always maintained but shaft wear is reduced and overheating is prevented.

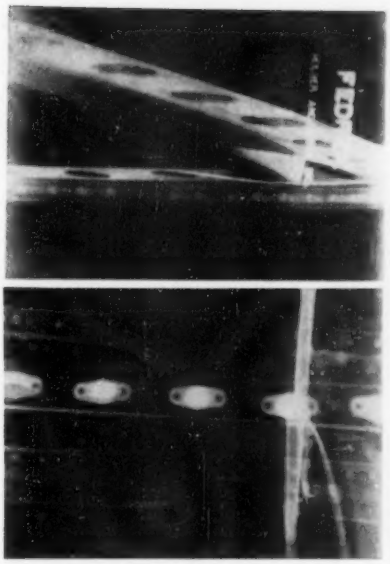
Clipper Seals are corrosion-resistant—The molded body is entirely non-metallic, is therefore unaffected by electrolysis and most forms of corrosion. And the garter spring is available in various corrosion-resistant metals.

Clipper Seals are versatile—They can be furnished in flange sections of varying widths to fit practically any cavity. Various lip designs are available . . . and various lip compounds provide the proper hardness for temperatures from −65F to +450F.

To find out more about Clipper Seals and their application to your particular sealing problems, write Johns-Manville, Box 60, N. Y. 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ontario.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville PRODUCTS for the AVIATION INDUSTRY



INTERNAL DEFECTS in B-36 wing (top) and aileron are picked up by X-ray.

amining the internal structure of Stratocruiser wings.

Parker believes, in routine maintenance of planes such as the DC-6, the X-ray service could be employed for examination of at least 90 critical and hidden areas, most of which now require disassembly for inspection, he says.

Lockheed Aircraft Corp. also has bought some of the equipment, is presently using it in field work for engineering information.

The aircraft company reports that it finds the equipment especially valuable in inspecting highly stressed areas in the internal structural members of airplanes that have high total hours. These areas cannot be inspected visually without removing major sections of the plane, the company points out, a costly operation in terms of both manpower and equipment.

▶ **Progressive Study**—Parker maintains that in addition to the immediate advantage of X-ray inspection, the films may be filed for a progressive record of conditions. Thus, development of corrosion can be watched. The X-ray will measure depth of corrosion within .006 in.

Radiographs are taken on 14 × 17-in film. Diagnoses are made by examination in a viewer. Prints are made only for illustration of the type of faults discovered, since X-ray film shows some 120 gradients of gray, and photographic paper only about 40.

Andrex X-ray equipment is sold in this country by Holgear-Andreasen, Inc., 703 Market St., San Francisco, owner of the Airex Co. and U.S. agent of the Danish manufacturer of the equipment.

Install WING Revolving Unit Heaters

An outstanding and exclusive feature of WING Revolving Unit Heaters is the revolving air distributor having one or more outlets.

As the distributor slowly turns, heated air is delivered from each outlet obliquely downward, in ever changing directions, to the working floor.

USERS SAY:
"Even heat distribution at the floor level."
"Air circulation below, around and above planes."
"No hot spots on planes or parts."
"Quick heat recovery after closing doors."
"Expedites servicing by melting ice and snow quickly."

Write for Bulletin HR-6

L. J. Wing Mfg. Co.

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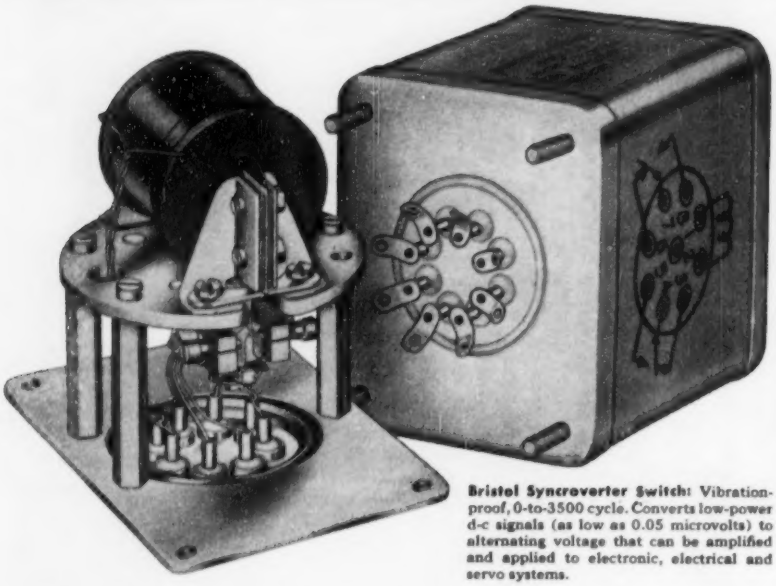


Bristol Syncroverter Switch: Vibration-proof, 0-to-3500 cycle. Converts low-power d-c signals (as low as 0.05 microvolts) to alternating voltage that can be amplified and applied to electronic, electrical and servo systems.

wide frequency-range precision inverter

can also be used as a precision synchronous rectifier or "ring demodulator"

Designed for military and industrial use: Bristol Syncroverter Switch is designed for a wide range of applications, including precision use in aircraft and guided missiles at high altitudes, gun directors, electronic computors, instruments, null detectors, and many similar devices.

Contacts: Contacts are provided for double-pole reversing switch action, or two synchronized independent single-pole double-throw actions.

Response: The switching time is in the order of 50 micro-seconds.

Effects of Thermal emf eliminated: Extremely small thermal emf's at the contacts are self-cancelling by the double-pole reversing contact arrangement.

Switching Dissymmetry: Less than ½ of 1 percent.

Hermetically sealed in a military-type case against dust and corrosion.

Write for complete specifications to The Bristol Company, 130 Bristol Road, Waterbury 20, Conn.

BRISTOL

FINE PRECISION INSTRUMENTS FOR OVER 60 YEARS

PRODUCTION BRIEFING

▶ **Cessna Aircraft Co.,** Wichita, is building a 280 x 120-ft. flight hangar. A 60 x 120-ft. bay in the hangar will be used as a paint shop.

▶ **Lockheed Aircraft Service-International,** N. Y. International Airport, has been awarded a contract by Slick Airways to provide Number 2 and Number 3 inspection service on the carrier's DC-6As.

▶ **Champion Spark Plug Co.** has broken ground on a new $2-million plant at Cambridge, Ohio, to provide 100,000 sq. ft. of floor space.

▶ **Aero Service Corp. (Mid-Continent)** has been formed at Tulsa by Aero Service Corp., Philadelphia, Pa., to offer expanded facilities for aerial exploration and mapping in the central U. S.

▶ **Arnav Aircraft Associates, Inc.,** Arnav Fitting Corp., and Industrial Fitting Corp. have moved their eastern offices and plant to a recently completed building at 32 Industrial Ave., Little Ferry, N. J. Phone is Diamond 3-9150.

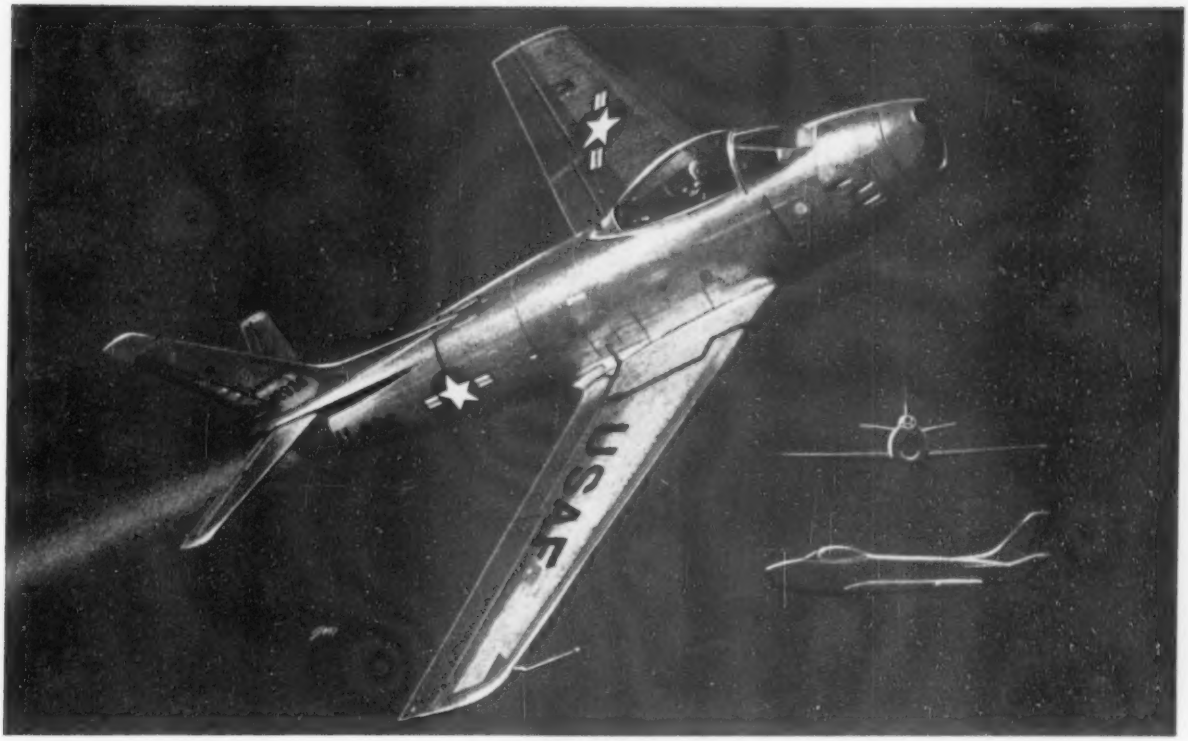
▶ **Mitchell Mobilhangar Corp.** has moved to 150 East 39th St., New York, N. Y.

▶ **Titeflex, Inc.,** Newark, N. J., has sold the design and manufacturing rights for an industrial filter for the electroplating market to Wagner Bros., Inc., Detroit, Mich.

▶ **Coast Pro-Seal & Mfg. Co.** is the new name for former Coast Paint & Chemical Co. of Los Angeles. Simultaneously, Aircraft Metal Forming Co., Inc., Burbank, and Aero-Cal Engineers, Inc., Burbank, have merged with the

FLEXIBLE COOLANT TUBE

Neoprene coolant tube for machines has copper core that allows it to be twisted into any shape for accurate direction of coolant flow. New tubing will last 25% longer than flexible metal tubes, says its maker, Acrobat Co., 1932 Vineyard, Los Angeles 16.



F-86F Sabre Jet

World's most lethal operational plane

There was no more effective fighter aircraft in the Korean skies than the North American Sabre Jet. The final score showed 800 MIG's were downed by them with a loss of only 58 Sabres in air-to-air combat.

North American Aviation's current production model of this single-seat fighter-bomber, the F-86F Sabre Jet, is powered by a General Electric J47 jet engine. It has a speed of over 650 mph, a tactical radius of over 500 miles, and a service ceiling over 45,000 feet.

One of the vital metals that has helped make the Sabre a mighty warrior is Inco Nickel. In fact, about 10% of the entire plane's weight consists of alloy parts containing nickel.

Many of these are made from the Inco Nickel Alloys which are used where unusual combinations of corrosion resistance, heat resistance, strength and ductility are needed.

Perhaps you have a metal problem calling for properties like these. Inco's Technical Service Section will gladly assist you in finding a solution. Write to them for the information you want.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

WHERE INCO NICKEL ALLOYS ARE USED IN THE F-86F

Monel

- Rivets (nine pounds of them in every plane)
- Fine tubing for engine fuel lines
- Lock wire on accessory parts of engine

Inconel

- Combustion liners
- Transition section
- Ignition system parts
- Lock wire in areas exposed to high temperatures

Nickel

- Spark plug parts
- Electrical & Electronic gear

Approximately 10% of the entire plane's weight is composed of alloys containing significant percentages of nickel.

Inco Nickel Alloys

MONEL® • "R"® MONEL • "K"® MONEL • "KR" MONEL "S"® MONEL • INCONEL® • INCONEL "X"® INCONEL "W"® • INCOLOY® • NIMONIC® Alloys NICKEL • LOW CARBON NICKEL • DURANICKEL®

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6.0∧SEC.±10%
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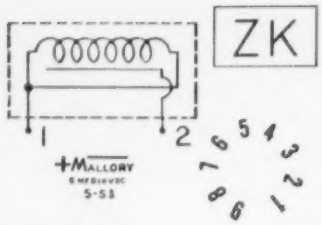

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Are better than rubber 3 ways

ENGRAVED *Vinylite* IS ACID-PROOF

Acid etching inks, used for permanent stamping on metal and all non-porous surfaces will eat away at rubber. Vinylite resists this action—gives longer life by far!

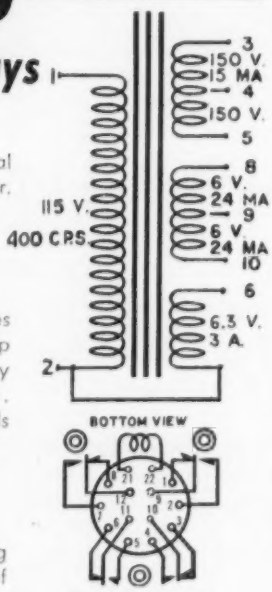
ENGRAVED *Vinylite* STAMP DIES GIVE RAZOR-SHARP IMPRESSIONS EVERY TIME

Opaque inks will clog shallow rubber stamp faces rapidly. Our deep-molded engraved VINYLITE stamp faces have more than three times the depth of ordinary rubber stamps. Markings always remain super sharp . . . the clearly identifying mark that distinguishes and labels your product of quality.

ENGRAVED *Vinylite* STAMP DIES HAVE CUSHION-LIKE RESILIENCE

Our VINYLITE molding process includes a timed curing that imparts to this versatile plastic all the elasticity of rubber. Resilient VINYLITE STAMP DIES resist abrasive action, conform to irregular surfaces . . . and last much longer!

Engraved Vinylite Stamp Dies are adaptable to any automatic or hand marking device. They can be used to stamp on every surface, metal, wood, fabric, paper, plastic, etc.



Some of the many industries now using ENGRAVED *Vinylite* STAMPS

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new firm. Each of the companies will operate at their present locations as divisions of the parent firm, Pro-Seal & Mfg. Co.

▶ **Boeing Airplane Co.,** Renton, Wash., has completed flight test program on the first KC-97 Stratofreighter completely equipped with Ford-built, P&WA-designed R4360 engines. Ford-built Wasp Majors are going into the KC-97F and KC-97G models of the Stratofreighter.

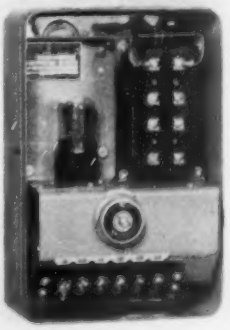
▶ **General Electric Co.,** Schenectady, N. Y., has shipped a 14-ft.-diameter, 122.5-ton fan rotor to Moffett Field, Calif., for use in a new NACA 110,000-hp. 16-ft. windtunnel.

▶ **Air Associates, Inc.,** Teterboro, N. J., has purchased Aviation Supply Corp., Atlanta, Ga., and will operate its acquisition as a new branch with M. D. Clark as manager.

▶ **Bensen Aircraft Corp.,** Raleigh, N. C., has dedicated a plant and heliport at Raleigh-Durham Airport, where it plans to develop and produce several new types of helicopters. President of the new firm is Igor B. Bensen.

▶ **Solar Aircraft Corp.,** San Diego, Calif., has expanded its Industrial Bellows Division and named Jack E. Daniel field representative.

▶ **Prewitt Aircraft Co.,** Clifton Heights, Pa., has delivered its first bonded metal rotor blades, designed for the big Piasecki YH-16, to the USAF for tests and evaluation.



SENSITIVE RELAY

This electronic relay, said to be highly sensitive to resistance changes, may be used to start or stop fractional horsepower motors when an ammeter or other current-measuring device reaches the required reading. Manufactured by General Electric, Schenectady 5, N. Y., the relay can be adjusted by a stepless dial. It may be used for liquid level control, operation of lights, solenoids and other operations in hangars and factories.

Light-Duty Press Brake Offers Big Unit Features

New light-duty press brake has variable-speed drive and other features usually found in larger units.

The machine offers welded plate construction, has twin-plate bed which is said to provide extreme lateral rigidity, minimum deflection, and a 14 in. slug clearance on multiple punching.

Manufacturer reports that the variable speed drive (infinitely variable between 20 to 50 strokes per minute) permits selection of an ideal speed to suit the nature of the work and the skill and speed of the operator. Application of the power over the ram is even, as a result of twin drive through a double back gear.

A friction clutch and band brake permit jogging and slipping to meet operating conditions. Ram adjustment is motorized and can be split so that one end can be raised or lowered to tilt ram for tapered work.

The unit is available in three sizes with capacities of 54 in. by 10 gage to 120 in. by 16 gage.

Dreis & Krump Mfg. Co., 7400 South Loomis Blvd., Chicago 36, Ill.

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LAND WITH
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● By reducing landing hazards the Westinghouse Decelostat equipment instills greater pilot confidence.

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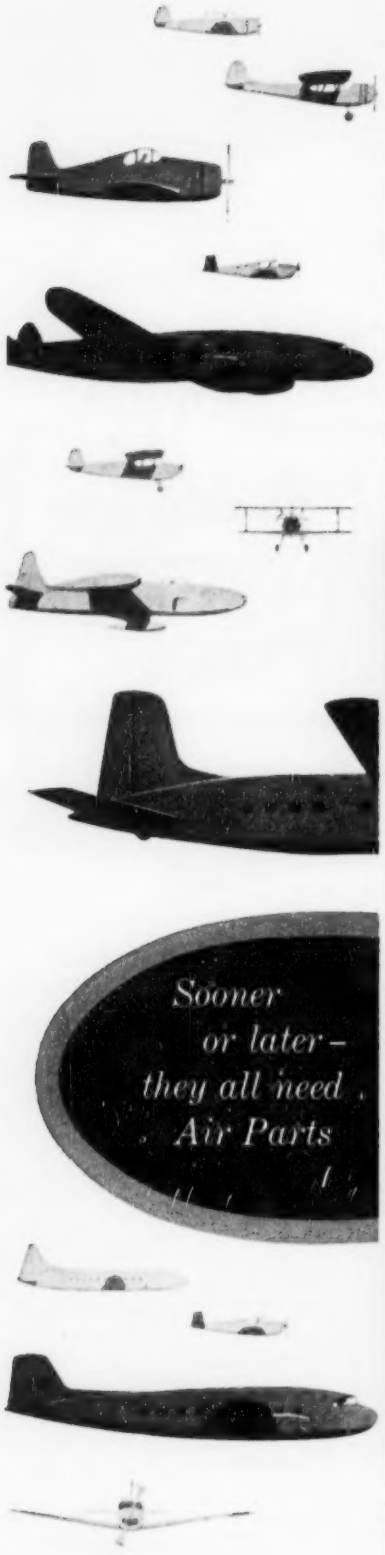


AIR-PARTS INC.
America's PIONEER Distributor
of Aeronautical Supplies.

USAF Contracts

Following is a list of recent USAF contracts announced by Air Materiel Command.

Consolidated Vultee Aircraft Corp., San Diego, Calif., procurement of T-29C trainers, 5, $750,000.

Eastman Kodak Co., 343 State St., Rochester 3, N. Y., station assy. sight, nose, 10 ea., 5 ea., spare parts, $767,836.

Kohler Co., 44 High St., Kohler, Wis., engine generator, 47 ea., spare parts, $179,979.

Link Aviation, Inc., Binghamton, N. Y., radio attachment, type MA-1, 128 ea., spare parts, $632,414.

Lockheed Aircraft Corp., Marietta, Ga., repair of GFAE and GFP, $115,000.

North American Aviation, Inc., Los Angeles International Airport, Los Angeles 45, aircraft maintenance handbooks, $100,000; design, installation and test on an F-86F aircraft, $306,500.

Pan American World Airways, Inc., Brownsville, Tex., overhaul of engines, 2,142 ea., $3,043,798.

Vectron, Inc., 400 Main St., Waltham 54, Mass., indicator, straight line, 5 ea., spare parts, $195,160.

Westinghouse Airbrake Co., Union Switch & Signal Div., Swissdale, Pa., simulator, $392,425.

Wilcox Electric Co., Inc., Fourteenth & Chestnut Sts., Kansas City, Mo., blower, 493 ea., tuning unit, 288 ea., motor spares, 526 ea., $211,113.

Standard Thompson Corp., 216 South Main St., Dayton, oil valves, 345 ea., 90 ea., 240 ea., $39,562.

Stein Bros., Mfg. Co., 1401 West Jackson Blvd., Chicago, line-lead, tow target, 6000 ea., $55,020.

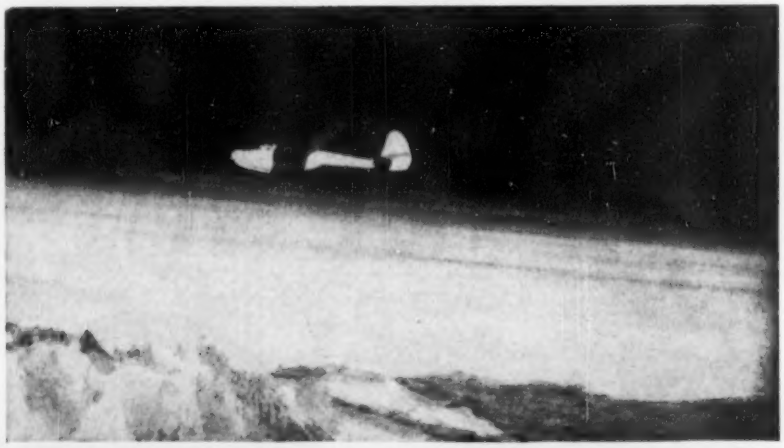
Steiner Plastics & Mfg. Co., Inc., Glen Cove, L. I., N. Y., B-29 radome, $157,856.

L. E. Stevens Co., P. O. Box 1667, Cincinnati, design, fabricate, install & test air turbine test facility for powerplant laboratory, 1 job, $726,012.

Stratford Pen Corp., 44 W. 28th St., New York, panel, cable, 810 ea., 2,551 ea., $105,853.

Sylvania Electric Products, Inc., Radio & Television Div., 254 Rano St., Buffalo, N. Y., radio transmitter, dynamotor unit, 2,914 ea., 3,271 ea., 2,947 ea., $3,750,000.

U. S. Gauge Div., American Machine & Metals, Sellersville, Pa., transmitter, oil pressure, 1,391 ea., $113,118; transmitter,



HIGH ON A MOUNTAIN WAVE

Pratt-Read glider soaring in lee wave of Sierra Nevada range is one of the craft used to explore nature of air flow over mountains in project conducted by Air Force Cambridge Research Center's Geophysics Research Directorate (Aviation Week, Aug. 17, p.244). Glider such as this soared to 44,500 ft. on up-current before flight was discontinued because cabin was not pressurized. Lower photo shows another cloud, actually a mountain wave crest, formed in lee of Sierra Nevada. Extreme turbulence was encountered in upper right portion of cloud, near the 40,000-ft. level.

The Reader AUDITED PAID ABC CIRCULATION *His Mark*

THE ABC that appears in the symbol at the top of this page stands for Audit Bureau of Circulations. The symbol itself is an emblem of cooperation, in which every subscriber to this magazine has an interest.

The Audit Bureau of Circulations is a voluntary, non-profit, cooperative association. It was founded in 1914 and now consists of 3450 advertisers, advertising agencies and publishers in the United States and Canada. This magazine is proud to be a member.

ABC originally was set up to help take the racket out of publishing, to eliminate the waste and guesswork then so prevalent in publishing and advertising, to establish order and confidence in place of the misunderstanding and misrepresentation that arose from unverified circulation claims and dubious circulation practices. Its mission was to protect the interests of both readers and advertisers.

THIS IT DID by first defining the term "paid circulation." Then it established standards and rules to govern subscription sales practices and records. Finally it set up an auditing organization to verify the claims and report the facts concerning the circulation of each member publication. It now maintains on that job a working staff of sixty-five full-time auditors. So the ABC symbol has become the hallmark of circulation standards and advertising values. Each member publication must maintain those standards if it wishes to retain its membership and display the ABC symbol.

This ABC audit is no perfunctory affair. When a business publication, such as this one, becomes a member of the Bureau, it agrees that the auditors shall have "the right of access to all books and records." Their inspection, therefore, may cover any part of its operations. Original subscription orders, payments from subscribers, paper purchases, postal receipts, arrears of payments, and many more items are painstakingly checked by the auditors. In many instances they go behind the records to seek verification from subscribers themselves as to the terms of their subscriptions.

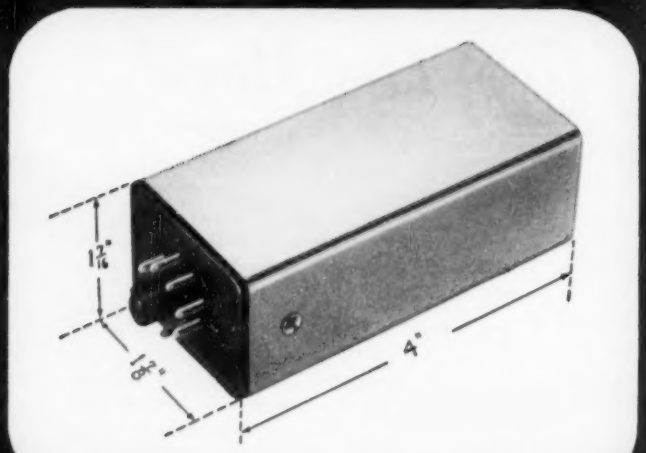
IN DOING ITS JOB, ABC has created many values for both publishers and readers as well as for advertisers. That is because the publication that becomes a member of ABC thereby offers the strongest possible guarantee of its primary devotion to the interests of its readers. The function of a business magazine is to be useful to its readers. When this service is rendered by an ABC publication, it is constantly subject to the practical test of reader acceptance and approval. As each subscriber has the right to purchase or refrain from purchasing an ABC publication, that collective right confers upon the readers the power to say whether or not the publication will survive. Thus the report on its ABC audit provides the most direct assurance that a publication stays in business only because of a voluntary demand by readers who find its editorial service responsive to their needs.

Naturally, the editor of each business publication follows closely the score thus racked up by his paper in its ABC reports. In the scope and tone of his editorial coverage and treatment, in the selection and presentation of his editorial content, he must constantly labor to maintain and enhance the readers' acceptance of his efforts. That is why the editorial standards established by ABC publications set the editorial standards for all publishing. That is how the ABC constantly stimulates its member publications to become even more useful to their readers.

AND THAT IS WHY the ABC symbol has become the Mark of the Reader, a constant reminder that his willingness to pay for an ABC publication is the acid test of its value both to him and to its advertisers.

McGraw-Hill Publishing Company

Precision Crystal Oven



Maintains Crystal Temperature—

to within 0.025°C at normal room temperature
—to within .15°C over outside range
from -40°F. to 150°F.

SPECIFICATIONS:

Operating temperature 75°C or 85°C

Warm up time for stable operation at –25°C — 7 minutes

Operates on 110 V, AC or DC (also in 6, 12, or 24 V models)

Mounting: standard base octal socket

Dimensions: 4" high—1⅞" wide —1-7/16" deep

Crystal holder type: HC-6

Meets applicable requirements of Mil—T—945A

Withstands 10 day humidity cycle at 95% relative humidity, in accordance with SC-D-15914

Vibration test method 10 to 33 CPS at 0.06 inch excursion

Operates in horizontal or vertical position

Standard finish as per U. S. A. specs 72-53 Type 1: or any finish to meet purchaser's requirements

The Caribe Aircraft Radio Corporation's new crystal oven was engineered to military specifications for use in secondary frequency standards. Its unusual ability to maintain crystal temperatures within such precise tolerances is due to its unique low mass thermostat, large expanding element and high lever multiplication, minimizing contact wear, giving long life and freedom from drift.

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torque pressure, 48 ea., 5 ea., 187 ea., $41,896.

Wagner-Smith Co., 541 E. Second St., Dayton, installation of electrical equipment & duct work for gyroscopic test stand, $45,493.

Webster-Chicago Corp., 816 N. Kedzie, Chicago, keyers 6,031 ea., $284,482.

Westinghouse Electric Corp., 32 N. Main St., Dayton, generator, 227 ea., 645 ea., 2,805 ea., $140,123; generators, spare parts, 595 ea., 537 ea., $502,981; technical changes, $198,299; spares, $342,026; generators, 1,330 ea., 135 ea., 900 ea., $953,089; panels, control, spare parts, racks, mounting, 1,500 ea., 900 ea., $440,846.

Whaling City Marine Co., 56 Prospect St., New Bedford, Mass., emergency cable cutter, 4877 ea., 5000 ea., $39,409.

Winder Aircraft Corp., P. O. Box 268, Winder, Ga., radio receiver 595 ea., $41,846.

Goodyear Aircraft Corp., 1210 Massillon Road, Akron 15, spares for ZP2K/3K airship program, $48,137.

United Aircraft Corp., Hamilton Standard Div., Windsor Locks, Conn., spare parts for C-118 type aircraft, $51,666; miscellaneous propeller and governor parts, $228,395.

Sikorsky Aircraft, United Aircraft Corp., Crane Building—South Ave., Bridgeport, Conn., maintenance trainer, 1 ea., $88,862.

Specialty Assembling & Packing Co., 79 Clifton Place, Brooklyn, N. Y., antenna system, 1,836 ea., 1,836 ea., 1,836 ea., $163,650.

Sperry Corp., Sperry Gyroscope Co., Great Neck, L. I., N. Y., overhaul and modification of auto pilot components, all, $100,000; radio set, 270 ea., $3,346,790.

M. Steinthal & Co., 222 Fourth Ave., New York, harness shoulder, $50,000 ea., $179,500.

Stewart-Warner Electric Div., Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago, receiving set, 170 ea., $219,777.

Strong Electric Corp., 87 City Park Ave., Toledo, Ohio, photographic light, 56 ea., $28,280.

United Aircraft Products, Inc., 1116 Bolander Ave., Dayton, valve assy., 400 ea., 288 ea., 326 ea., $29,603; cap assy.-valve, 1,458 ea., valve assy.-oil surge, 84 ea., fuel cock, 507 ea., $54,965; bellows assy.-fuel pump, 2,059 ea., pump assy.-fuel hand, 761 ea., cooler assy.-oil, 674 ea., $514,873.

U. S. Electrical Motors, Inc., Box 2058 Terminal Annex, Los Angeles, motors, 460 ea., $257,668.

United States Rubber Co., Fuel Cell division, Mishawaka, Ind., misc. B-45 fuel cells, 13 ea., 8 ea., 7 ea., $29,679.

Viewlex, Inc., 35-01 Queens Blvd., Long Island City, N. Y., aircraft camera magazines, 1,581 ea., 1,581 ea., $766,215.

Warner Bros. Picture, Warner News, Inc., New York, N. Y., production of motion picture, 1 ea., specification changes, $44,800.

Watts Mfg. Co., Ronceverte, West Virginia, temperature control processing kit, 293 ea., $155,182.

Wm. R. Whittaker Co., Ltd., 915 N. Citrus Ave., Los Angeles, plate pressure SW, 15 ea., pin-switch hyd. pressure, 2,685 ea., nut-switch hyd. pressure, 2,687 ea., $172,835.

Wollensak Optical Co., 850 Hudson Ave., Rochester, N. Y., camera, WF8, 35-mm, 3 ea., camera, Fastax, 8-mm., 1 ea., camera, Fastex, 16-mm., 2 ea., $77,757.

Yardley Industries, 138 Parsons Ave., Columbus, Ohio, water supply kit, 15 ea., $31,643.

General Electric Co., X-Ray Department, 4855 Electric Ave., Milwaukee, KA-2 camera system, $5,921,468.

B. F. Goodrich Co., 500 South Main St., Akron, T-33, fuel cell assy., 144 ea., $60,480.

Grimes Mfg. Co., Urbana, Ohio, light assy., 1,196 ea., 1,656 ea., 3,007 ea., $32,638.

Hycon Mfg. Co., 2961 East Colorado St., Pasadena 8, Calif., aircraft camera magazines, tools, spares and data, 1,528 ea., $666,301.

Johnson Fare Box Co., 4619 Ravenswood Ave., Chicago, charger, 20-mm., 2,396 ea., 818 ea., $982,807.

Kearfott Co. Inc., 1150 McBride Ave., Little Falls, N. J., indicator, 2,009 ea., $255,826.

Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst, N. Y., indicators, airspeed, 67 ea., transmitters, altitude, 61 ea., computer and transmitter, 122 ea., $261,816.

Lear, Inc., Romec Div., Elyria, Ohio, pres-

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sure pump, 650 ea., pump, 1,125 ea., control panel, 675 ea., $604,462.

Link Aviation, Inc., Binghamton, N. Y., jet instrument trainer, 1 ea., 17 ea., instrument trainer, 342 ea., $585,292.

Mercury Electronic Co., Box 450, Red Bank, N. J., converter, static, 1,332 ea., 136 ea., 485 ea., $200,425.

Mole-Richardson Co., 937 N. Sycamore Ave., Hollywood, Calif., lamp assy., 59 ea., difference in unit price in packaging, 68 ea., $30,453.

Packard-Bell Co., 12333 West Olympic Blvd., Los Angeles, 64, homing group, 10 ea., 13 ea., 1 set, $30,000.

Radio & Television Div., Sylvania Electric Products, Inc., 254 Rano St., Buffalo, receiver, transmitter, junction box, $4,410,-036; tuning units, 1,257 ea., 446 ea., ballast tubes, 18,222 ea., $228,051.

Wilding Picture Productions, Inc., 1345 Argyle St., Chicago, production of a motion picture, $279,219.

Bachman Wholesale Co., Box 237, Rochester, N. Y., was surplus items, $367,755.

Sparton Automotive, Sparks-Withington Co., Jackson, Mich., charger, 5,715 ea., 2,146 ea., $839,749.

Sperry Gyroscope Co., Great Neck, L. I., N. Y., directional gyro indicator, 81 ea., spare parts, data, 496 ea., $565,062.

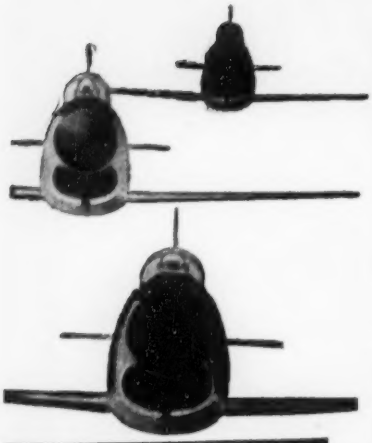
Square Root Mfg. Corp., 391 Saw Mill River Rd., Yonkers, N. Y., filter control assy., 2,186 ea., $45,625.

Thompson Products, Inc., 23555 Euclid Ave., Cleveland, motor, 400 ea., 680 ea., 95 ea., $164,436.

Union Electric & Mfg. Co., 1057 Summit Ave., Jersey City, oscillator, 811 ea., $88,956.

United Aircraft Products, Inc., 1116 Bolander Ave., Dayton, U 765 fuel cock, 25 ea., U 770 fuel cock, 161 ea., U 845 fuel cock, 362 ea., $44,266.

Vare Mfg. Co., Inc., 1801 Walnut St., Garland, Tex., D-3 power supplies, 145 ea., 290 ea., 163 ea., $597,644.



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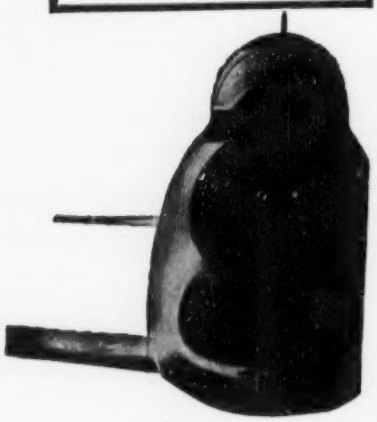

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Royal Electric Inc., Jamestown, Ohio, motor-generator, 1,208 ea., 416 ea., 202 ea., $1,408,901.

Son Ray Photo Co., Inc., 295-309 Lafayette St., New York, photographic set, 146 ea., $66,389.

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J., indicators, attitude, numerical, pitch scale, remote, 6 ea., $52,804.

Graham Aviation Co., Graham Air Base, Marianna, Fla., primary pilot training school, $3,280,565.

Lear Inc., 110 Ionia Ave., N. W., Grand Rapids 2, Mich., indicators, attitude, numerical, pitch scale, remote, 6 ea., $51,818.

Stanley Aviation Corp., Buffalo Municipal Airport, Buffalo, N. Y., belt, aircraft safety, lap, 17,121 ea., $1,074,685.

Fast Writeoffs

Accelerated tax amortization for manufacturers expanding their defense facilities is granted by the government in the form of certificates of necessity.

In the following list of recent certificates, company name is given, followed by product or service, cost of construction deemed necessary for defense expansion, and the percentage of the expansion cost allowed for fast writeoff. Fast writeoff permits property to be depreciated in five years.

- **United Aircraft Corp.**, Sikorsky Aircraft Div., Bridgeport, Conn., helicopter & parts, $17,500,000, 75%.
- **Link Aviation, Inc.**, Binghamton, N. Y., aircraft parts, $324,000, 60%.
- **McKiernan-Terry Corp.**, Dover, N. J., steam catapults for military, $39,756, 65%.
- **McKiernan-Terry Corp.**, Harrison, N. J., catapults for ships, $165,000, 65%.
- **Bendix Aviation Corp., Red Bank Div.**, Eatontown, N. J., miniature motors elec. equipment for defense, $45,000, 40%.
- **Island Machine Co., Inc.**, Farmingdale, N. Y., machining of aircraft parts, $26,443, 70%.
- **Bendix Aviation Corp., Bendix Radio Div.**, Towson, Md., aircraft radio & radar equipment, $29,425, 65%.

SOLVES HEAT PROBLEMS

Thermal problems involved in the design of small aircraft motors can be solved in a fraction of the time previously required using this new thermal analog computer developed by General Electric's Specialty Motor Sub-Dept. Called ETAC (electronic thermal analog computer), the device can solve one- to four-mesh thermal problems involving intermittent motor duty cycles, forced convection and vapor cooling, to an accuracy of 3%, GE says. Thermal problem is set up in electrical terms and the answer is displayed in form of a temperature-time curve on a calibrated cathode ray tube.

- **Delta Air Lines, Inc.**, Atlanta, Ga., air transportation, $7,205,000, 80%.
- **Continental Aviation & Engineering Corp.**, Detroit, Mich., research and development for aircraft, $928,599, 50%.
- **Saffran Engineering Co.**, St. Clair Shores, Mich., aircraft parts, $767, 70%.
- **Bendix Prod. Div., Bendix Aviation Corp.**, Mishawaka, Ind., Ordnance, $117,432, 40%.
- **Cornelius Co.**, Columbia Heights, Minn., aircraft parts, $9,389, 45%.
- **McDonnell Aircraft Corp.**, St. Louis, Mo., aircraft, $308,060, 40%.
- **Folsom Co., Inc.**, Rockwell, Tex., aircraft tools & parts, $387,500, 45%.
- **O & M Machine Co., Inc.**, Los Angeles, Calif., aircraft parts, $236,993, 70%.
- **General Metals Corp., Adel Div.**, Burbank, Calif., aircraft parts, $57,035, 65%; aircraft parts, $144,372, 65%.
- **Protair Corp.**, Los Angeles, Calif., aircraft parts, $35,989, 70%.
- **Hydro-Aire, Inc.**, aircraft accessories, $228,393, 65%.
- **McDonnell Aircraft Corp.**, St. Louis, aircraft, $856,900, 60%.
- **Fairchild Engine & Airplane Corp.** (Guided Missile Div.) Wyandanch, L. I., N. Y., aircraft parts, $12,119, 65%.
- **Goodyear Tire & Rubber Co.**, Akron, developing and testing airplane tires, $586,000, 70%.
- **Ryan Aeronautical Co.**, San Diego, Calif., aircraft parts, $9,889, 65%.
- **Bendix Aviation Corp.**, Davenport, Iowa, aircraft components, $88,235, 50%.
- **Rocket Jet Engineering Corp.**, Glendale, Calif., precision machining of aircraft parts, $6,816, 70%.
- **Basic Metals, Inc.**, Montebello, Calif., aircraft components, $15,700, 70%.
- **National Utilities Corp.**, Pasadena, Calif., aircraft clamps and couplings, $86,844, 60%.
- **Hoover Electric Co.**, Los Angeles, Calif., aircraft components, $46,669, 70%.

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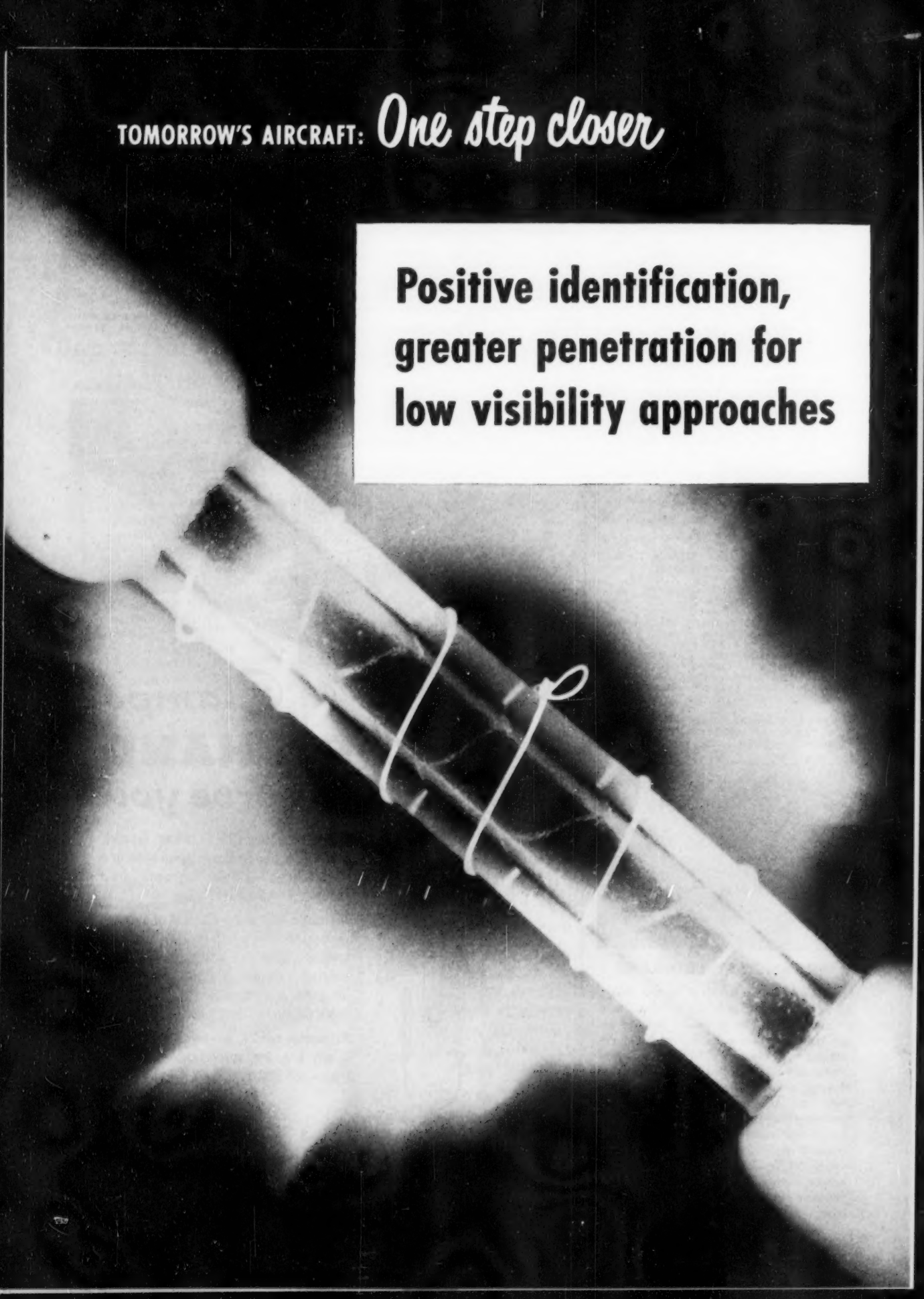
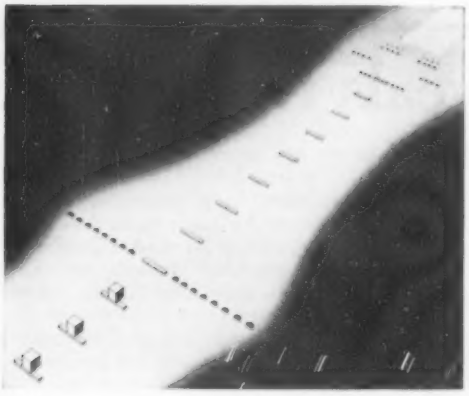


Over 3 billion candlepower—man's most brilliant light source—can help supply aviation's "missing link" during restricted visibility landings. An exclusive Westinghouse innovation in lighting equipment, it can become a truly effective key element in Approach Lighting Systems, guiding the pilot from approach portal to runway threshold. It conquers the thickest weather and permits *earlier*, *positive* identification of the runway approach on transition from instrument flight to visual contact . . . long acknowledged as the most critical period during any instrument approach.

This extreme penetrative power is achieved through Westinghouse engineering which couples a number of Krypton Flash units with a master flash synchronizer. At maximum intensity this combination can pierce 1,000 feet of zero-zero weather by a series of 3,300,000,000 candlepower flashes seen as a "lightning stroke". When incorporated with steady burning lights in a proper approach lighting configuration—it eliminates the possibility of the system being confused with any other lighting pattern. And for safe follow-through, Westinghouse also provides powerful Hi-Intensity Runway Lights for final runway definition.

This application of experienced lighting research . . . Krypton and flash synchronization . . . to produce peak output and the unique articulated stroke effect is a typical Westinghouse solution to Aviation Industry problems. And, most important, this positive identification provides an essential step in bringing truly safe, economical and dependable flight One Step Closer. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-91069



The Krypton Flash unit is shown at left with the tubular Krypton lamp in place. The flash lasts only 17 microseconds and is too short in duration to have a blinding effect on pilot. Spread is about nine degrees. A lower step of brightness is provided for better visibility conditions. At right is a typical approach pattern where the Krypton Flash units are superimposed on a single-row, center-line system of steady burning lights.

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What the Airlines Want

Equipment	Percentage of Airlines Voting*	Number of Equipments Wanted** (Preference of those voting)						
		2	1+P	1+S	1	0+P	0+S	0
VHF Communications:								
Transmitter	90%	66%	31%	1%	2%			
Receiver	90%	59%	36%	3%	2%			
HF Communications:								
Longhaul & Overwater A/C	96%	69%	17%		14%			
Shorthaul & Feeder A/C	84%		7%		76%		14%	3%
VOR (Omnirange)	89%	100%						
Glide Slope Receiver	94%	78%	15%	1%	6%			
Marker Beacon Receiver	99%				88%	1½%	1½%	12%
DME (Distance Measuring Equip)	75%	35%	5%	24%	35%			1%
Radar Transponder Beacon	74%		3%	19%	70%			8%
Airborne Radar:								
Longhaul & Overwater A/C	87%				90%	10%		
Shorthaul & Feeder A/C	54%				36%	13%		51%
Low-Alt. (Radio/radar) Altimeter:								
Longhaul & Overwater A/C	88%				45%	3%	16%	36%
Shorthaul & Feeder A/C	53%				40%		16%	44%

Equipment	Percentage of Airlines Voting*	Number of Equipments Wanted** (Preference of those voting)						
		2	1+P	1+S	1	0+P	0+S	0
VHF Communications:								
Loran:								
Longhaul & Overwater A/C	88%				53%	3%	7%	37%
High-Alt. (Radio/radar) (Altimeter)								
Longhaul & Overwater A/C	88%				63%	18%		19%
Shorthaul & Feeder A/C	62%					6%		94%
ADF (Auto Direction Finder):								
Longhaul & Overwater A/C	99%	100%						
Shorthaul & Feeder A/C	82%	68%	7½%	13½%			11%	
Fluxgate/Gyrosyn Compass:								
Longhaul & Overwater A/C	99%	91%	1%	8%				
Shorthaul & Feeder A/C	81%	85%		14%				1%
Flight Director	69%				40%	6%	19%	35%
Automatic Pilot & Coupler:								
Longhaul & Overwater A/C	89%				100%			
Shorthaul & Feeder A/C	70%				42%			58%
Electronic Fuel Gage	78%			24%	76%			
Public Address System	89%				99%	1%		

* Formula for arriving at Percentage of Airlines Voting: $\frac{\text{No. of A/C Operated By Voting Airlines}}{\text{Total No. of A/C Operated By All U. S. Airlines}} \times 100$

** 1+P: One set plus mounting and wiring provisions for a second set
1+S: One set plus space for a second set
0+P: None installed but with mounting and wiring provisions for one set
0+S: None installed but space for one set

Survey Reveals Airlines' Avionic Goals

By Philip Klass

For the first time, the avionic industry has a detailed guide as to the type and amount of equipment that scheduled U. S. airlines want in their future aircraft.

This information, the result of an Aeronautical Radio, Inc., survey of the airlines, is formally presented in Arinc's Report No. 304. The report is the first of its kind in terms of scope and detail and its figures may be the subject of some disagreement.

The report not only tells "What," but also indicates "Whose." How many airlines want DME (distance measuring equipment) or airborne radar, for instance, whether single or dual installations are required, and which manufacturer's equipment is now preferred (although this is always subject to change) are covered by the survey.

► **Of Particular Interest**—The Arinc survey gives the first industry-wide reading on airline acceptance of several new avionic equipments which are not presently in general use. Here is what it shows:

• **DME.** On the basis of a 75% industry vote, it appears that 99% of the future airliners will have at least one DME installed and 35% will have dual installations. It is interesting to note that United Air Lines wants dual DME installations but no marker beacon receiver, apparently planning the extra DME as a substitute for the marker beacon receiver.

• **Airborne radar.** Approximately 90% of the future four-engine aircraft may be equipped with radar, but only 36% of the twin-engine aircraft are likely to be so equipped, the Arinc survey indicates.

European Survey

Success of Arinc's Airlines Electronic Engineering Committee (AEEC) has prompted several foreign airlines to form a similar group, called the European Airlines Electronic Committee (EAEC). EAEC, whose membership now includes Sabena, SAS, Air France, KLM, and Swissair, has already started an avionic equipment survey similar to that completed recently by Arinc's AEEC.

• **Radar transponder beacon.** On the basis of a 74% industry vote, 92% of all future aircraft will carry at least one radar transponder to improve ground surveillance radar's ability to spot and identify aircraft in bad weather. Twenty-two percent of the votes called for one radar beacon installed plus space or wiring provisions for a second unit, but there were no votes for dual beacon installations.

► **For Guidance Only**—In its introductory remarks, the Arinc report cautions that "this report is intended to provide guidance to Arinc member airlines and to the airframe manufacturers in planning new electronic installations for future aircraft. . . . It is recognized that the views of the airline industry will undergo evolutionary change on many of the points outlined in this report. Therefore, revisions will be made to this report as plans for new aircraft and electronic systems develop."

Arinc emphasizes that the report is only a summary of **many** probable requirements and is not an industry-wide standard.

► **4-Engine Crystal Ball**—With this note of caution in mind, an analysis of the Arinc report indicates that future four-

TWIN-ENGINE transports would need less avionics equipment for their routes than . . .

FOUR-ENGINE craft, which must fly farther and over water, Arinc report shows.

engine aircraft for longhaul and overwater operations will, in all likelihood, contain the following avionic equipment:

- **Two VHF communications receivers and transmitters,** or one of each plus wiring and mounting provisions for the second set.
- **Two HF communications transceivers,** or one set plus provisions for the second.
- **Two VOR (omnirange) receivers.**
- **Two ILS glide slope receivers.**
- **One marker beacon receiver.**
- **One or two DMEs.**
- **One radar transponder beacon.**
- **One airborne radar.**
- **Two automatic direction finders.**
- **Two fluxate/Gyrosyn compasses.**
- **One autopilot and approach coupler.**
- **One electronic fuel gauge.**
- **One public address system.**

There is roughly a 50/50 chance that these aircraft will be equipped with a flight director. If the planes are used in overwater operations, it is probable that they will also carry loran, plus both a high-altitude and a low-altitude radio/radar altimeter.

▶ **2-Engine Outlook**—The avionic-equipment requirements for twin-engine shorthaul-feeder aircraft will differ from those of four-engine aircraft, Arinc's survey indicates. Some of the requirements.

- **HF communications.** One set instead of two.
- **Airborne radar.** Less than a 50/50 likelihood of being equipped.
- **Low-altitude altimeter.** Less than 50/50 possibility of being equipped.
- **High-altitude altimeter.** None.
- **ADF.** Good possibility of a single rather than dual installation.
- **Autopilot.** Less than a 50/50 chance of being equipped.
- **Loran.** None.

▶ **How It Began**—Last October, Arinc's Airlines Electronic Engineering Committee decided to form a subcommittee to coordinate airline avionic equipment installation matters. (AEEC is a 16-man group with one representative from each of 12 U.S. and Canadian airlines plus one each from the Air Transport Assn., International Air Transport Assn., Arinc, and the Military Air Transport Service.)

The Installation Coordination Subcommittee, decided to concentrate on future aircraft and sent out equipment preference survey forms to 42 U.S. airlines, whose combined fleet totals nearly 1,250 aircraft. Over half of these air

MINIATURE RATE gyros

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- No Heating Required Over Entire AN Range
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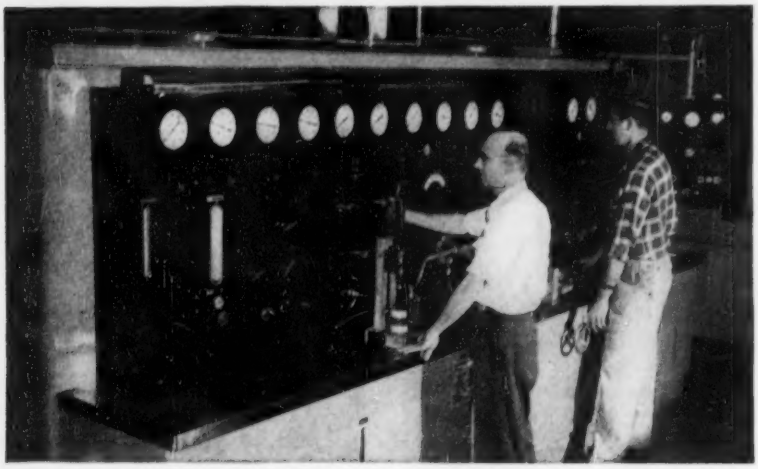
SANTA MONICA, CALIFORNIA

GREER TOPICS

Important News of Aviation & Industrial Test Equipment



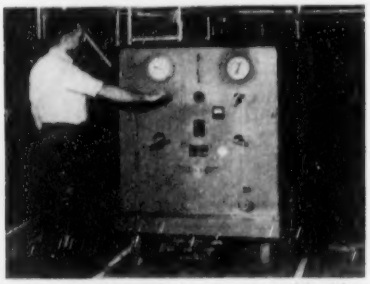
Greer Jet Engine Fuel System and Pump Test Stand, shown here in Boeing's Wichita plant, is used to test fuel pumps and fuel system accessories used on the stratojet engines.

How Boeing Checks Stratojets with Greer Test Equipment

The photographs on this page show four typical scenes in Boeing's test department. We could show you dozens more. All these shots have one thing in common. The test equipment shown in use is made by Greer Hydraulics.

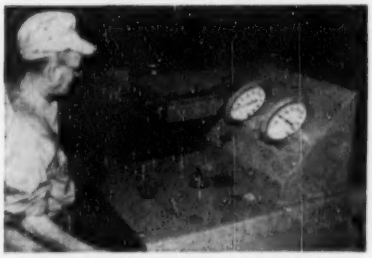
Name any aircraft manufacturer, both here and abroad, and it's ten to one you'll find Greer equipment in their testing operations. The name Greer means accuracy and dependability, the two all-important qualities in test precision equipment.

Pioneers in this field, Greer has standardized its machines until you can order them for most purposes right out of a catalog (yours on request). If your needs call for custom designing, we can do that too.

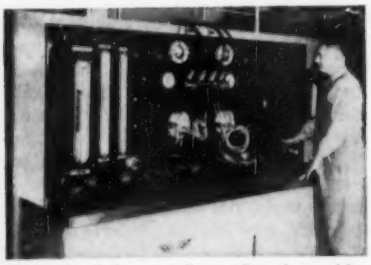


Greer Portable Hydraulic Test Machine provides hydraulic test fluid for checking hydraulic systems of modern aircraft.

GREER
TEST EQUIPMENT



Greer Hose Tester tests from one to six hose lines or similar production components to pressure of 25,000 psi. Covered burst chamber is provided for safety.



Greer Fuel Booster Pump Stand provides dual sumps and test chambers so run-in and performance testing can be accomplished on two components at one time.

Greer Hydraulics Inc. 454 Eighteenth Street, Brooklyn 15, New York

Field Offices: 1908 West Cermak Road, Chicago, Illinois • 25 South Main Street, Dayton, Ohio 2832 East Grand Boulevard, Detroit, Michigan • and sales representatives in all principal cities

carriers, flying 90% of the total U.S. scheduled airliners filled in and returned their questionnaires, although not all airlines answered every question.

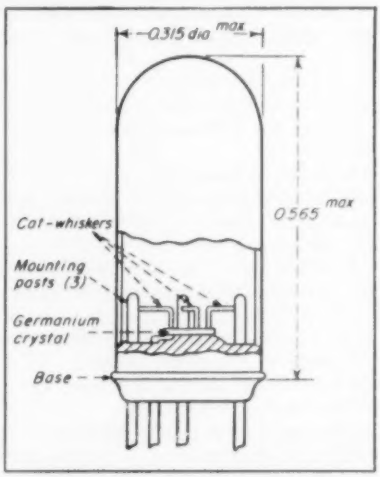
Where an air carrier wanted only one, or none, of a specific equipment installed in its future aircraft, it was asked to indicate whether it wanted the airframe manufacturer to provide either space or complete mounting and wiring provisions so that (additional) equipment could be installed by the airline at a later date.

▶ **Weighting the Returns**—Recognizing that the number of aircraft operated by some participating airlines is 25-50 times larger than the fleet size of others, Arinc chose to weight the returns with what it calls a "Potential Aircraft Purchasing" (PAP) factor, assigned on the basis of each airline's present fleet size.

For example, equal weight (PAP factors) was given to the replies of Trans-World Airlines, American Airlines, Pan American World Airways, United Air Lines and Eastern Air Lines (whose fleets vary between 111 and 163 aircraft) by assigning each of them a PAP factor of 11.

Braniff, Capital, Northwest, Delta, and Flying Tiger airlines (fleet size ranging from 33 to 57) were each assigned a PAP factor of four (Arinc's survey was conducted before Delta's merger with Chicago & Southern).

PAP factors of two, one, or two-



4-ELEMENT TRANSISTOR

Tetrode and pentode transistors of the point-contact type have been announced by Sylvania Electric Products, Inc. The four-element tetrodes (employing three catwhiskers instead of the customary two) are now commercially available for the first time, Sylvania says. Company expects to be in production on five-element pentode transistors by the end of the year. New tetrodes and pentodes can replace triode transistors on a one-for-two and one-for-three basis in some circuits, Sylvania says. Address: 1740 Broadway, New York 19.

tenths were assigned to airlines with smaller fleets.

For certain types of equipment, such as HF communications and radar, the number of equipment installations wanted may depend upon the type of airplane and its intended use. In these instances, Arinc asked the airlines to indicate their avionic equipment preference for four different types of operations: overwater, longhaul, shorthaul and feeder.

Where the survey returns indicated that the plane's operational use made a significant difference in the number of equipment installed, Arinc Report No. 504 breaks down the returns accordingly.

▶**Open to Question**—The use of PAP factors made Arinc's tabulating task easier and in many cases it does not seriously detract from the realism of the summarized results, despite the fact that one airline may have 50% more aircraft than another airline assigned the same PAP factor.

However, for those equipments where airline preference is broken down by operational types of aircraft, the use of PAP factors appears open to question. Here the returns are weighted by the airline's fleet-size PAP factor despite the fact that only a portion of its fleet (longhaul, shorthaul, etc.) is under consideration.

For example, when American Airlines and Continental Air Lines (with PAP factors of 11 and 1, respectively) vote on shorthaul aircraft equipment, AA "outvotes" Continental 11:1 although AA's twin-engine (shorthaul) fleet is only six times larger than Continental's.

▶**Aviation Week Summary**—To give readers what is believed to be a more realistic summary of airline avionic equipment preferences, AVIATION WEEK has computed a new set of data based on actual airline fleet size instead of using PAP factors.

A careful analysis of the Arinc report also indicated that airline equipment preferences for longhaul and overwater types of aircraft were sufficiently similar to permit combining these two categories into one: "Longhaul & Overwater Aircraft." The same procedure is generally possible with shorthaul and feeder-type aircraft without distorting airline preference trends.

When these combined categories are used, it is then possible to weight each airline's equipment preference according to the number of four-engine or twin-engine aircraft in its present fleet, thereby avoiding the previously cited problem.

▶**Data Presentation**—In the AVIATION WEEK summary, each airline was given one vote for each of its airplanes (or for each of its twin-engine or four-engine aircraft, where there is a preference breakdown by operational type). These "votes" were then converted into percentages of the total airlines' fleet which was voted on the particular question.

Some airlines, uncertain of future needs, indicated preferences in certain lines of equipment but not in others. For this reason, the AVIATION WEEK summary shows what percentage of the total scheduled airline fleet voted in each of the survey questions.

▶**Important Contribution**—One of the major roles of Arinc's AEEC is to bring together airline, aircraft, and avionic equipment engineers (as well as government and military representatives, wherever possible) to hammer out equipment characteristics (specs) to guide manufacturers developing avionic equipment for the airlines. The objective is to achieve a greater degree of equipment standardization among the airlines.

This new equipment preference survey is an important addition to AEEC's previous activities in the avionics field.

Norden Gets Navy Contract

Navy has contract with Norden Laboratories Corp., of Milford, Conn., for the production of a Norden-designed bomb director system, the company has announced.

Facts and Figures!..

Figure:

50th Anniversary of Flight or no 50th Anniversary of Flight, femmes in funnel-fitted millinery for centuries have celebrated Halloween doing Lazy 8s and spins, powered only by supersonic broomsticks. Coming in for a neat 3-point landing is Sally Taylor, 17, 5'4", 120 lbs., blue eyes, blonde hair.

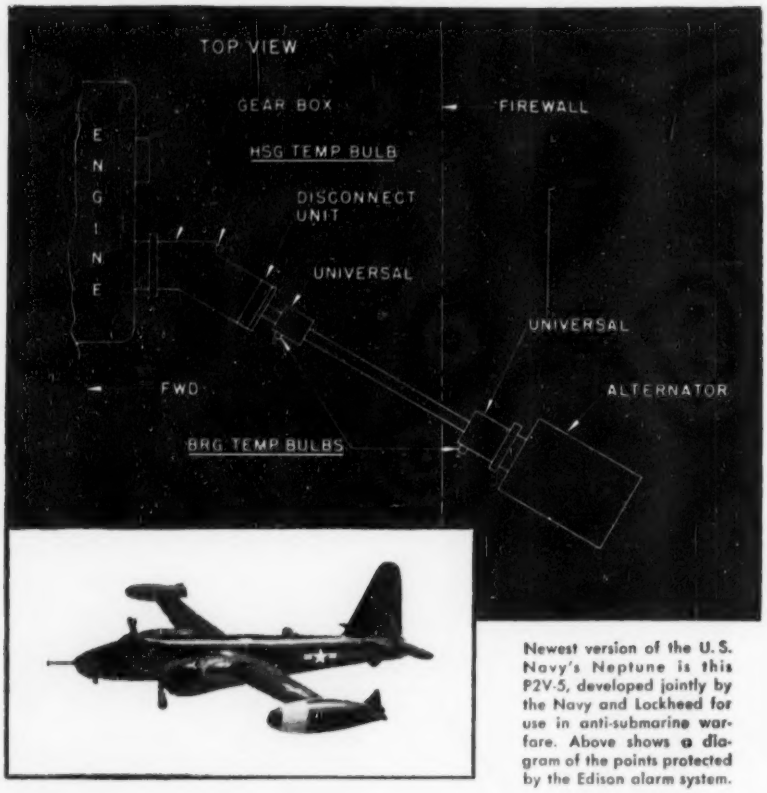
Fact:

Pratt & Whitney Aircraft — a proud name in the history of powered flight — joins its distributor, Southwest Airmotive, in staging a fact-packed Engine Maintenance & Operation Forum Wednesday, Oct. 14, in our newly-enlarged plant at Love Field. SAC salutes P. & W. as a unique pace-setter in thusly bringing factory know-how to pilots and maintenance men assembled here from throughout the Flying Southland!

Southwest Airmotive COMPANY
LOVE FIELD | DALLAS

Lockheed Neptune Gets New

Temperature Warning System



Newest version of the U. S. Navy's Neptune is this P2V-5, developed jointly by the Navy and Lockheed for use in anti-submarine warfare. Above shows a diagram of the points protected by the Edison alarm system.

A NEW EDISON Temperature Alarm System keeps its sensitive "fingers" on three spots in the alternator drive system. Should the temperature at any or all spots rise to 150°C, an alarm automatically signals in the flight compartment. The alternator drive system is so designed that it can be immediately disengaged before serious damage can happen.

THREE STANDARD resistance bulbs, a small control assembly (wgt. 1.5 lbs.), and a panel light make up the system. The bulbs are installed as shown in the diagram. Each bulb continuously "feels" the temperature at each point. When the temperature reaches its critical level, the alarm comes on, and, if the temperature returns to normal, automatically shuts off.

THE SYSTEM can be adapted to any number of circuits and still retains its basic simplicity. For information concerning specific applications, write to—

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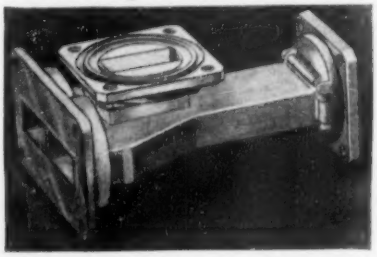
Instrument Division
Dept. 49, West Orange, New Jersey

New Components for Microwave Designers

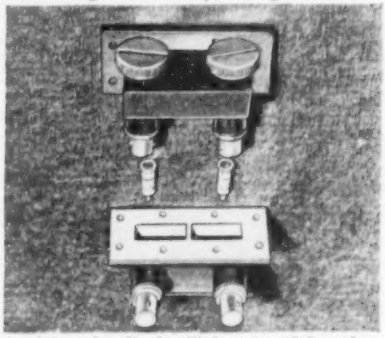
Airtron, Inc., has announced three new microwave components which have possible application to airborne, ground radar or microwave stations. These include:

• **Folded hybrid waveguide** for use in balanced mixer applications in the frequency range of 8.5 to 9.6 kmc. It has the following characteristics: voltage



standing wave ratio into either arm is less than 1.2; isolation is greater than 40 db.; power split is better than 0.05 db., according to the manufacturer.

• **Miniaturized dual crystal holder** for use with the direct and reverse crystals developed by Microwave Associates (1N23B and 1N23BR). Holder is designed to mate with miniaturized contact flanges currently being standard-



ized by the Radio-Television Manufacturers Assn. committee on waveguide connectors.

• **High-power reversing switch** for use in the 2.6- to 3.95-kmc. frequency band. It is designed to connect two microwave inputs to either of two outputs. The device can be used to receive and transmit to alternate antennas in a

microwave repeater station or provide a connection to a dummy load enabling a standby radar to be adjusted or repaired without interrupting service. The switch has a maximum VSWR of 1.10 over the design range with crosstalk isolation of 50 db. minimum, the company says. Switching is accomplished in less than one second by means of a permanent magnet motor.

Airtron's address: 20 E. Elizabeth Ave., Linden, N. J.

FILTER CENTER

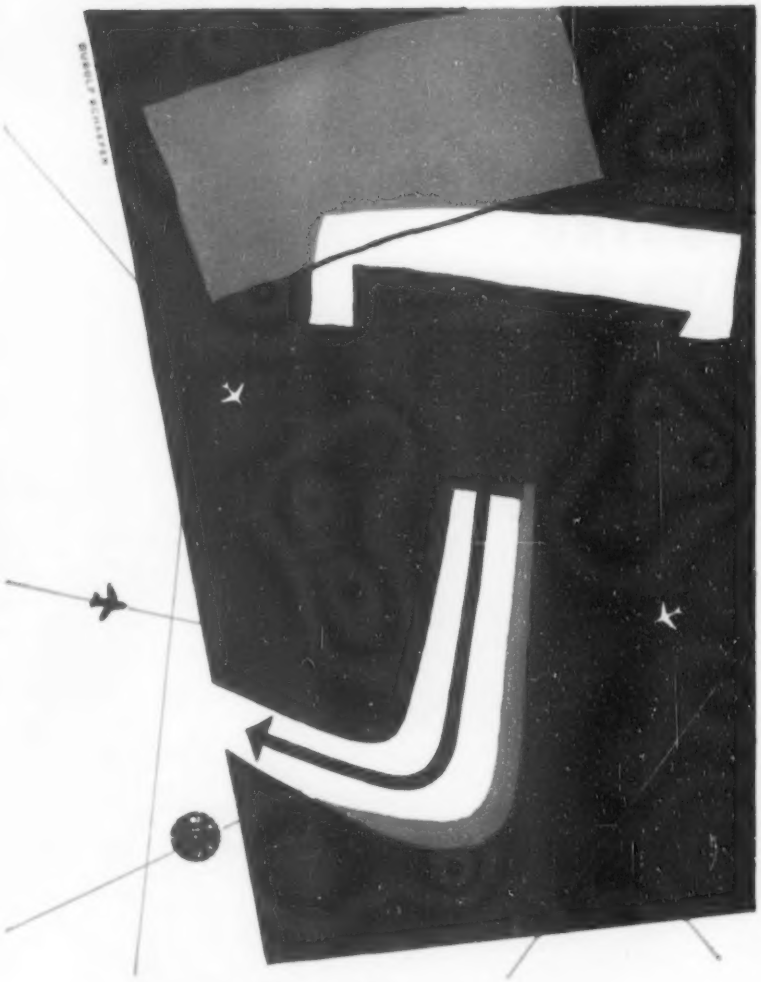
▶**Mag Amplifier Standardization**—A program to develop a line of standard magnetic amplifiers, much as vacuum tubes are now standardized, is being contemplated by the Electronic Components lab at Wright Air Development Center. ECL currently has an outside contractor preparing a manual intended to assist industry engineers in designing magnetic amplifiers.

▶**RTCA Forms New Committees**—Radio Technical Commission for Aeronautics has formed two new special committees, SC-66 and SC-68. SC-66 will study the responsibilities and objectives of the many industry and government committees operating in the fields of aeronautical telecommunication and electronics, and recommend ways of eliminating overlapping responsibilities and improving coordination. SC-68 was formed to study possible UHF television interference with distance measuring equipment (DME) and recommend corrective measures, if needed.

▶**Shakedown Shack**—Summers Gyroscope Co., Santa Monica, Calif., has built a small "block house" for tests of highspeed gyro rotors. Heavy bullet-proof glass and periscopic mirrors permit Summers engineers to witness tests without danger if spinning rotors disintegrate.

▶**New Silicon Diode**—Development of a silicon alloy diode whose back-to-forward resistance ratio is approximately 1,000 times higher than existing germanium diodes has been announced by Bell Telephone labs. The new silicon diode has a back-to-forward resistance ratio of approximately 1,000,000:1 at room temperature. The new diode can operate at temperatures up to 200C without serious reduction in resistance ratio, a Bell spokesman says. Germanium diode operation is normally limited to temperatures under 70C.

▶**Elgin Eyes Avionics**—Elgin National Watch Co. is moving into two new



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SALES REPRESENTATIVES IN PRINCIPAL CITIES

fields—miniature electronic components and precision instruments—to diversify its activities, according to J. G. Shennan, company president. Reduction in the size of present transistors may be one of Elgin's first goals, Shennan indicates, followed by sub-miniaturization efforts on other electronic components. Elgin is looking for companies already in the components field that might be interested in affiliating, Shennan says.

► **Lear Damper for Cougar**—Grumman has ordered a sizable quantity of Lear yaw dampers to provide improved directional stability on its F9F-6 and may backfit earlier Cougars. The damper is similar to the one used in the North American F-86D (AVIATION WEEK Feb. 16, p. 59).

► **Convenient Slide Rule**—The correct values of shunt resistors to be used with a tapped linear potentiometer to convert it to a non-linear function can be easily determined with a new plastic disc calculator devised by Servotrol Co. Details on the new slide rule and its price can be obtained from Servotrol Company, Eastern Branch Office, Framingham Centre, Mass.

► **Recently announced publications** of possible interest to persons in the avionics field include:

• **Automatic controls.** An eight-page brochure entitled "Everything Under Control" describes the avionic and automatic control activities of Minneapolis-Honeywell and illustrates components suitable for highspeed aircraft. Minneapolis-Honeywell, Aeronautical Div., 2600 Ridgway Road, Minneapolis 13, Minn.

• **Magnetic cores.** Tape-wound magnetic cores in both rectangular C and round toroidal types suitable for saturable reactors, power transformers, and similar applications are described in a new booklet WC-353 by Thomas & Skinner Steel Products Co. Bulletin includes B-H curves for 400-cps. cores. Thomas & Skinner Steel Products Co., Inc., 1152 23rd St., Indianapolis, Ind.

• **Capacitors and pulse networks.** Aircraft-Marine Products has published a 28-page booklet giving design and test data on its AMP capacitors and pulse-forming networks. The devices are designed to meet MIL-C-25 specs and are capable of operating over the temperature range of —55C to 135C with no derating, the company says. Capacitors and networks designed for operation at 3 kv. and above, using a new synthetic dielectric which cuts size and weight by 50-70%, are also described. Aircraft-Marine Products, Inc., 2100 Paxton St., Harrisburg, Pa.

• **Capacitors.** Performance characteristics and test specs on a line of new high-temperature (125C) subminiature paper capacitors are contained in bulletin AB-18 prepared by Astron Corp. A similar bulletin, AB-19 describes Astron's Hy-Met line of high-temperature (125C) metallized paper capacitors. Astron Corp., 255 Grant Ave., East Newark, N. J. —P.K.

WHAT'S NEW

New Books

The Spirit of St. Louis by Charles A Lindbergh. Published by Charles Scribner's Sons, New York, N. Y., 562 pages including appendix and glossary, numerous illustrations. Price $5.00.

This, to my mind, is the greatest flying story ever written. It was 14 years in the writing by the only one who could have done it, the man who, almost miraculously, kept the tiny "spirit of St. Louis" aloft for 33 hours 30 minutes 29.8 seconds back in 1927 and brought it in for a perfect night landing at Le Bourget Airport, Paris.

The airplane itself was a miracle. Designed and built from scratch in two months. Then 14 hours of flight testing before flying cross-country to historic Roosevelt Field. And with approximately 27½ hours in its log, off to Paris nonstop, solo.

To the newspapers and millions of readers he was "Lucky Lindy," a young daredevil pilot. But Lindbergh was one of the sharpest pilots alive even before he took the controls of the Whirlwind-powered Ryan.

Years of barnstorming, parachute exhibition jumps, flying for the Army, long airmail flights by the seat of the pants in all kinds of weather were some of the reasons he hit the coast of Ireland only three miles off course.

This is the kind of flying story everybody in the industry should read and then let their children read. It may well become an all-time classic.—**EJB.**

Trade Literature

Deburring, die and mold polishing, blending grind lines, scale removal, honing of cutting tools and re-plating cleaning with regular-velocity and high-velocity pressure-blast wet-blasting equipment is detailed in catalog issued by The Cro-Plate Co., Inc., 747 Windsor St., Hartford 5, Conn.

Miniature ball bearing design and application data for bearings of .100-in. to .375-in. o.d. is subject of 20-page catalog being distributed by Miniature Precision Bearings, Inc., Keene, N. H.

Thiokol synthetic rubbers for resisting oils, solvents, aging and effects of temperatures are described in bulletin available from Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

Catalog of Facilities for handling fabricated parts and sub-assemblies, permitting manufacturers to concentrate on assembly and finishing operations, is being distributed by Reynolds Metals Co., 2500 South Third St., Louisville, Ky.

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53-3

Readers Comment on ARDC Issue

Letters continue to arrive commending AVIATION WEEK's staff for the Aug. 17 issue that tells the story of the Air Research and Development Command.

Military, industry and government reaction to this 454-page issue—the largest in AVIATION WEEK history—is sampled in the following letters.

Extraordinarily Fine

. . . It is an extraordinarily fine job, not just because it says that the Air Research and Development Command is honest and earnest, but because it is one of the most complete reporting jobs that I have ever seen on a very difficult subject.

JAMES MCCORMACK, JR., Maj. Gen., USAF
Vice Commander
Air Research and Development Command
Baltimore 1, Md.

Gen. Partridge's Thanks

. . . Since I have just left the Research and Development Command, this volume is especially timely insofar as I am concerned. It provides a progress report on the work done by people in the Research and Development Command in the first three years of its existence. On behalf of the Command, please accept my sincere thanks for a splendid job.

E. E. PARTRIDGE, Lt. Gen., USAF
Deputy Chief of Staff Operations
Department of the Air Force
Washington 25, D. C.

A Patriotic Service

We in the Air Research and Development Command are most gratified at the discerning interest taken by your publication in having a close look at what the Command is doing, and in describing our efforts to the general public. In so doing, you have indeed done the nation a patriotic service.

It is encouraging and heartening to us, who are striving for improved quality in the weapons of air power, to see AVIATION WEEK express its objective, far-sighted view that our nation needs an ever increasing capability to defend its people and its ideals through the effective and, in the long run, economical means of adequate air power.

Thank you again for your kind thoughtfulness. It has been a genuine pleasure to talk to you and to your excellent staff.

FLOYD B. WOOD, Brig. Gen., USAF
Air Research and Development Command
Baltimore 3, Md.

. . . Congratulations on a job so splendidly done.

KURT M. LANDON, Brig. Gen., USAF
Chief of Staff, Air Research and Development Command
Baltimore 1, Md.

. . . It will serve as an eloquent witness of the important contributions which you and AVIATION WEEK have made to the vital cause of better air weapons for tomorrow. . .

ALBERT A. ARNHYM, Col., USAF
Air Research and Development Command
Baltimore 3, Md.

From Gen. Putt

I . . . read the ARDC issue of AVIATION WEEK from cover to cover. . . . I have heard nothing but the finest of comments and complimentary remarks from all who have seen it.

It was indeed a pleasure for us here in Headquarters to work with you and your staff and I have had like expressions from our Center Commanders. All of those Commanders with whom I have had an opportunity to speak have been most happy at the coverage given their particular Center. I sincerely believe that you, the staff of AVIATION WEEK, and the McGraw-Hill organization have rendered a most valuable service not only to the Air Research and Development Command but to the Air Force as a whole.

D. L. PUTT, Lt. Gen., USAF
Commander, Air Research and Development Command
Baltimore 1, Md.

Most Accurate

May I add my sincere congratulations to the many other hundreds you have undoubtedly received on the Aug. 17 issue of AVIATION WEEK featuring the Air Research and Development Command.

It is the most complete, accurate, and best written story ever published on the Command. We have made arrangements for several thousand reprints of the text matter for orientation of new personnel being assigned to this Headquarters and our Centers.

It was also a pleasure to work with you and your editorial task force headed by Bob Hotz. The entire Public Information staff here, including Maj. Arthur Dreyer, Chief of the Information Division, Lt. John Lent, Assistant Chief of the Information Division, and Lt. Thomas Burleson, Chief of the Liaison Division, have had nothing but praise for the thorough and efficient manner in which your staff was organized and the ability of the individual writers. I doubt if the readers of the magazine realize that it required more than six months of research and writing, and thousands of miles of travel to put together such a complete and accurate story between the covers of one issue of AVIATION WEEK.

LEON BOOTH, Col., USAF
Public Information Officer
Air Research and Development Command
Baltimore 3, Md.

From ARDC Centers

Your ARDC issue of AVIATION WEEK was, in my opinion, one of the finest presentations of the military establishment that has ever been done. Your presentation of such a clear picture of our Command to the public will inevitably foster better understanding of the research and development function within the Air Force. AVIATION WEEK can take pride in this excellent example of objective reporting.

Bill Coughlin did a fine job of reporting on the Air Force Flight Test Center. We are particularly fond of him since he really gave us a treatment which compared very favorably with that of any other Center. In addition, he acquired his information with a minimum of interference with our work and a maximum amount of friendly cooperation. He deserves to be commended.

J. S. HOLTONER, Brig. Gen., USAF
Commander, Air Force Flight Test Center
Office of the Commanding General
Edwards AFB, Calif.

We received our first copies of the Air Research and Development Command issue on Friday, and I have spent the weekend reading it with a great deal of pleasure and admiration.

I am amazed at the amount of factual information you have been able to present accurately, yet in a thoroughly readable style. This is the best over-all presentation I have ever seen of the role and the problems of Air Force research and development.

Please accept my congratulations and appreciation for performing an outstanding service to aviation research and development and to every individual who is interested in the future of our Air Force.

DON R. OSTRANDER, Col., USAF
Commander, Holloman Air Development Center
Holloman AFB, N. M.

I have just received my . . . copy . . . and want to thank you very much for your thoughtfulness. I certainly appreciate it and shall enjoy displaying it to my associates.

J. W. MARCHETTI, Technical Director
Air Force Cambridge Research Center
Cambridge 39, Mass.

. . . May I congratulate you on the excellence of your presentation!

It was indeed a pleasure for us here at the Air Force Missile Test Center to be able to participate in the preparation of this fine article.

WILLIAM L. RICHARDSON, Maj. Gen., USAF
Commander, Air Force Missile Test Center
Patrick AFB, Fla.

. . . Although your magazine is one which we at Rome Air Development Center look forward to reading each week, this special ARDC issue is being read and reread by all interested personnel. I compliment you on doing an excellent job of publicizing our mission and activities.

D. C. DOUBLEDAY, Brig. Gen., USAF
Commander, Rome Air Development Center
Griffiss AFB, Rome, N. Y.

I want to drop you a line and congratulate you on the excellent articles in the ARDC issue. We are very happy that you took such interest in our people, facilities, and program. Your presentation was by far the best complete coverage that RADC has had in any magazine.

O. J. SCHULTE, Lt. Col., USAF
Assistant DCS/R&D
Rome Air Development Center
Griffiss AFB, Rome, N. Y.

. . . AVIATION WEEK has done an outstanding job of presenting a vital function of the Air Force to the American public.

HAROLD W. NORTON, Col., USAF
Commander 6541st Operations Group (Range)
Patrick AFB, Fla.

I have just received the ARDC issue of AVIATION WEEK . . . I appreciate very much receiving this beautifully bound volume.

F. O. CARROLL, Maj. Gen., USAF
Commander, Human Resources Research Institute
Air Research and Development Command
Maxwell AFB, Ala.

I would like to congratulate you and your staff for the splendid job which was done on the ARDC issue of AVIATION WEEK.

I agree with you wholeheartedly that this issue of AVIATION WEEK will do a great deal toward creating a better understanding of ARDC and its place in the national effort.

What little our Command did to assist you, I can assure you, was indeed a pleasure.

JOHN S. MILLS, Maj. Gen., USAF
Commander, Air Force Special Weapons Center
Kirtland AFB, N. M.

Boost for Avionics

ARDC ISSUE SUCCESSFULLY DEMONSTRATES THE IMPORTANCE, THE ACCOMPLISHMENTS AND THE VITAL NECESSITY OF THE AIR RESEARCH AND DEVELOPMENT COMMAND. YOUR PUBLICATION WAS PERFECTLY TIMED TO PUBLICIZE A USAF COM-

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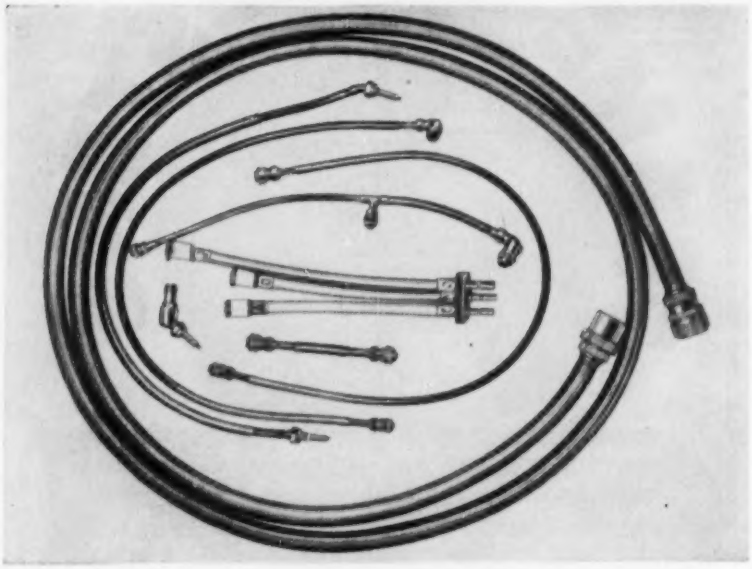

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DAVID CALLAHAN
DIRECTOR OF PUBLIC RELATIONS
GILFILLAN BROTHERS
1815 VENICE BLVD.
LOS ANGELES, CALIF.

Excellent Reporting

. . . I thought the job on the Air Research and Development Command was an excellent piece of reporting. I particularly enjoyed the free use of visual material, as it pointed up the important aspects of the story.

BERT C. GOSS, Senior Vice President
Hill and Knowlton, Inc.
Empire State Building
New York 1, N. Y.

The Secretary asked that I thank you for your thoughtfulness in providing him with AVIATION WEEK's special edition on the Air Research and Development Command. He was quite interested as were all the members of this office with this very fine edition.

WILLIAM G. HIPPS, Brig. Gen., USAF
Executive Assistant
Secretary of the Air Force
Washington, D. C.

Constructive Journalism

Have just read your ARDC issue from cover to cover. Sincere congratulations on a piece of accurate, constructive and courageous journalism.

T. F. WALKOWICZ
30 Rockefeller Plaza
New York 20, N. Y.

I have not yet had a chance to read this thoroughly but know I will find it of interest and a valuable source of information.

JOSEPH T. MCNARNEY, President
Convair, Consolidated Vultee Aircraft Corp.
San Diego 12, Calif.

Thanks very much for your thoughtfulness in sending me an extra copy of AVIATION WEEK of Aug. 17. I think it is a splendid presentation and very thoroughly done. It can be very useful as reference material.

MILTON W. ARNOLD,
Vice President, Operations & Engineering
Air Transport Assn. of America
Washington, D. C.

May I take this opportunity to thank you for your thoughtfulness in sending me the special edition of AVIATION WEEK for 17 Aug. 1953. . . A brief perusal indicates that I will find this to be a very interesting issue.

LEWIS S. PARKS,
Rear Admiral, U. S. Navy
Chief of Information
Department of the Navy
Washington 25, D. C.

(*More letters about ARDC issue on p. 62*)

PILOT PROTECTION AGAINST "G" FORCES

Aro's new "Anti-G" Valve plays a vital role in today's protection of jet pilots.

This valve links the pilot's "Anti-G Suit" to a supply of compressed air. Any sudden change in "G" force (gravity or centrifugal force caused by turns, dives or climbs) opens the valve. Air accurately metered for the existing flight conditions is admitted to the "G" suit bladders, creating pressure on the legs, thighs and front abdomen. This pressure prevents the pilots blood from rapidly draining from his head down into his body thus preventing "blackout".

For further details on this "Anti-G" valve and other high-precision aircraft products produced by Aro write:

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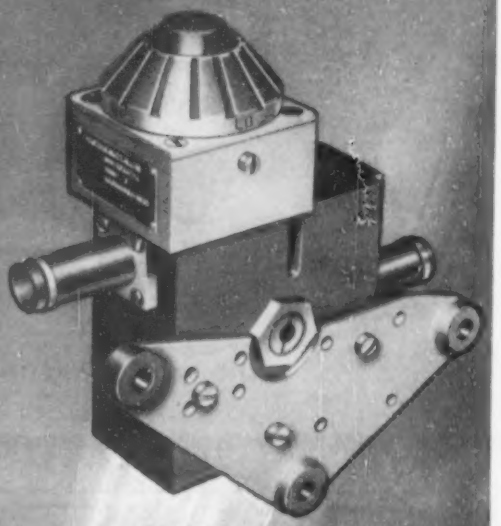

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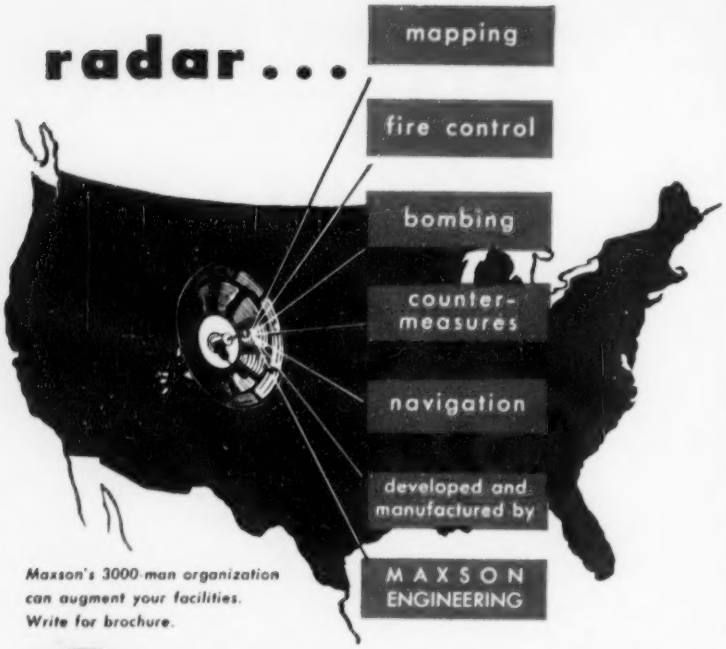

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Comment from Congress

I believe you have brought into better focus a very important segment of our military operations, and I have found the issue most helpful.

Sen. Homer Ferguson
Committee on Appropriations
Washington, D. C.

Many thanks for the personal copy of the Air Research and Development Command Edition of Aviation Week. This is going to be most valuable in conection with my work on the Armed Services Committee.

Sen. Ralph E. Flanders
Committee on Armed Services
Washington, D. C.

. . . From a cursory examination, it is indeed a most outstanding edition and you and your staff are to be commended most highly for the efforts put forth therein.

Robert C. Hendrickson
Committee on Armed Services
United States Senate
Washington, D. C.

Your thoughtfulness in sending this ARDC issue is greatly appreciated. I am very glad indeed to have it in hand.

Sen. Leverett Saltonstall
Committee on Armed Services
Washington, D. C.

I want to thank you for sending me the handsome volume—"The Air Research and Development Command" edition of Aviation Week. I shall enjoy reading this . . .

Sen. John Sherman Cooper
Committee on Interstate and Foreign Commerce
Washington, D. C.

. . . From a cursory glance I have found it to be attractive, interesting and useful, and I appreciate your thoughtfulness in sending it to me.

Sen. Russell B. Long
Washington, D. C.

. . . It is a fine tribute to a basic part of our continued strength in the air if it is to be maintained. I know that I shall find the magazine interesting and informative.

Sen. John C. Stennis
Committee on Armed Services
Washington, D. C.

In the absence of Sen. Symington, I wish to acknowledge your letter of Sept. 4 and the copy of "The Air Research and Development Command" edition of Aviation Week.

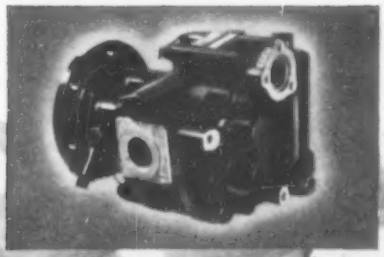
I am sure the Senator will appreciate your thoughtfulness in sending him a copy of this issue, and I will bring it to his attention at the first opportunity.

C. B. Roberts
Staff of Sen. Symington
Committee on Armed Services
Washington, D. C.

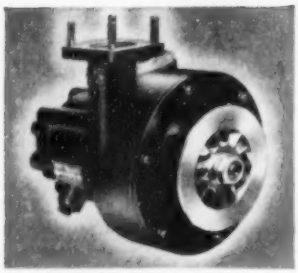
This will acknowledge receipt of your letter of Sept. 4, and the copy of "The Air Research and Development Command."

I am sure I will find this publication interesting and informative.

Dewey Short
Committee on Armed Services
House of Representatives
Washington, 25, D. C.



Engine-driven
Gear Pump



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EQUIPMENT

Forum Eyes More Powerful DC-3

Transport's cruise would be 20-30 mph. faster after switch to R2000 powerplant, engine meeting hears.

By George L. Christian

Millville, N. J.—The Engine Operation and Maintenance Forum, co-sponsored here by Airwork Corp. and Pratt & Whitney Aircraft, was presented with a suggestion for an immediate DC-3 "replacement": the DC-3 with R2000 engines instead of its present R1830-92s.

More than 100 representatives of the airlines—scheduled and non-scheduled, American and foreign—and of government and military agencies, petroleum companies, fixed-base operators and equipment manufacturers heard a team of P&WA powerplant specialists at the day-long conference. Airwork's representation of 20 executive, sales and service personnel was headed by the company's president, Francis L. Hine.

▶ **Souped-Up DC-3**—Here's what P&WA said about the DC-3: "If you want a souped-up DC-3, install an R2000 engine in the plane. This will give you a good, 700-hp. powerplant at cruise. And the R2000 has been engineered into the DC-3 satisfactorily and with practically no weight penalty by Panagra."

The R2000 boosts the plane's cruising speed to 180-190 mph. from its present 160 mph.

By installing lightweight propellers and oil coolers on the R2000s, no appreciable increase in overhang moment of the engine is experienced, therefore no structural changes are needed. Nor is there any increase in overall weight.

Principal advantages to be derived from putting R2000 engines in DC-3s, according to P&WA, are better altitude performance and better single-engine operation. With R2000s, you can pull 700 hp. for cruise instead of the 600 hp. for R1830s.

Although the R2000 gives 1,450 hp. at takeoff power, such settings are unusable on the DC-3 because too much strain is imposed on the rudder control system to compensate for increased yaw in case of engine failure. P&WA recommends that takeoff power with R2000s on DC-3s be restricted to 1,200 hp. unless a rudder boost system is installed to take care of the increased yaw.

▶ **Price Goes Down**—Pratt & Whitney offered to sell the R2000 (D3 or D5, single-blower series, to any operator who might be contemplating such a changeover for $36,000. Airwork's sales manager, J. W. Gillespie, countered this with a price of about $22,000 for completely overhauled, zero-timed, modified R2000s. Later P&W lowered its price to $30,350.

The engine company has no present intention of souping up its R1830-92 engines, whose principal role is in the DC-3. They agree that installing R-1830-75 cylinders on the -92 model gives a cooler-running powerplant, but they do not believe that cooler operation justifies pulling more power from the engine. The structural components of the engine may not satisfactorily withstand higher powers than those specified for the -92. So P&WA engineers turn "thumbs down" on the "Super -92."

▶ **Conference Day**—The forum's morning session was taken up by three speeches:

- The Pratt & Whitney Aircraft Engine and Its Place in Present-Day Aviation.
- Moderation and the Wasp Engine.
- General Engine and Aircraft Operation—Current Transport-Type Airplanes.

There was an open session during the afternoon portion of the meeting.

▶ **Reversing Props**—P&WA's thinking in regard to reversing props was brought out in the morning talks. To be efficient as a braking means, props should be reversed as soon as the aircraft touches down when traveling at high speed, P&W says.

Reversing props at low speed is relatively ineffective and has the added disadvantage of picking up stones which are flung into prop blades and fuselage sides. At high speeds, stones are left far behind.

P&WA spokesmen do not believe that prop reversing has had bad effects on aircraft engines, although sudden reversal of airflow around relatively hot cylinders is not desirable. They recommend that propellers be reversed only as a means of decelerating an aircraft and never as a means of maneuvering in tight spots on a ramp or to back a plane into position.

▶ **Cruise Control**—Torquemeters are a must for efficient long-range cruise control, the forum was told. BMEP gauges provide the only means of determining maximum efficient lean best power. Such a power setting, while providing the most power for the least gasoline, has the disadvantage of being hard on exhaust valves because of the corrosive chemical composition of exhaust gases at extremely lean mixtures. Airlines are willing to accept this exhaust valve toll because of the money saved by low fuel consumption, say P&WA representatives. But these same mixtures are definitely uneconomical for operators of Twin Beech and similar, relatively short-ranged airplanes, they say.

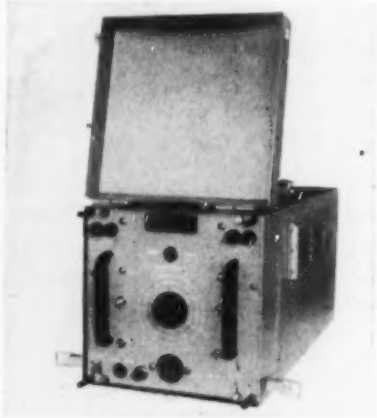
For smaller engines not equipped with torquemeters, such as the R1830 and the R985, P&W suggests the following manual leaning procedure:

After finding maximum cylinder head temperature in lean mixture position, continue leaning in small increments until a 5-deg. C. drop from the maximum is reached.

The procedure is long and tedious, P&W warns, because after each mixture adjustment, three to five minutes must elapse before the next setting so that head temperature has time to stabilize.

▶ **Automatic Feathering**—Autofeathering elicited this ambiguous and unenthusiastic comment: "The device has contributed to saving more aircraft than it has lost."

A Convair crash, several years ago, was cited as the sole destructive accident attributable to a malfunction of the autofeathering system (a piston in the torque nose of the engine which energizes the autofeathering system was broken). Although the plane was to-



STANDARD DME

DME test set of this type will be used by all airlines, military operators and maintenance shops using or servicing distance measuring equipment when it becomes standard for transports. Polytechnic Research and Development Co., 202 Tillary St., Brooklyn 1, N. Y., developed this set on Air Navigation Development Board contract, under technical cognizance of Wright Air Development Center.

tally burned out, passengers and crew escaped.

▶ **Ignition**—Low-tension ignition got a boost at the meeting.

"It provides a better, hotter, faster spark at the plug, does not erode the plug electrodes as rapidly as high-tension ignition and is lighter than HT," said the specialists.

▶ **Oil Starvation**—Master rod bearing failures in R1830 engines installed on DC-3 airplanes are not usually due to improper fits or tolerances, according to A. E. Hale, P&WA's airlines engineer.

Rather, a majority have been traced to oil starvation caused by hoppers in the oil tanks interfering with proper oil delivery to the engine. (Although not specifically mentioned, it is probable that the hoppers, being small, do not give oil returning from the engine sufficient space or time to de-aerate, and oil that is still foamy, with lowered lubricity, is pumped into the engine.)

When asked how to remove the hopper and what rerouting of oil lines in the oil tank are required, Hale referred the questioners to Canadair in Montreal. They have had ample experience.

▶ **Oil additives**—"We build our engines to operate satisfactorily with oil to which no additives have been added," P&WA said.

However, no serious objection was raised against detergent oils except that they should not be used in engines containing sludge. Detergent oils have the property of removing sludge deposits, and this may result in clogging screens, oil passages, etc., thus promoting oil starvation of certain parts of the engine.

▶ **Corporate Aircraft**—There are no time limitations on corporate aircraft engines, P&WA says. Best yardsticks to determine whether an engine is ready for major overhaul are its operation and oil consumption.

However, the engine company specialists urged corporation fleet operators to pattern their engine overhaul times after those for similar engines used by scheduled airlines.

▶ **Incidental Comment**—Here are some incidental comments made at the open session during the afternoon portion of the Airwork-P&WA forum:

• **Cleaner engines.** Engines are a lot cleaner at overhaul if oil is changed every 200-430 hr.

• **New screens.** New disk-type screens give 100-150% greater screening capacity than previously used basket or Dutch-weave screens.

• **Oil viscosity.** Should lighter oils be used in the winter and heavier in the summer? P&WA stated a general rule: If plane is equipped so that oil temperature may be kept pretty constant summer and winter, the same viscosity may be used all year round. If not, then lighter and heavier oils should be used

The new Bendix-Pacific TOR-6 Oscillator gives improved performance with resistance type strain gages and variable resistance type temperature pickups. The unit operates with unusual stability under extreme conditions of environment.

Unbalance of the resistance bridge provides a voltage which is used to change the frequency of the oscillator. The magnitude and direction of the frequency change is proportional to the magnitude and phase of the bridge output.

SPECIFICATIONS

Bridge Impedance: 120 ohms*
Sensitivity: ±7.5% change of f_o for 0.125% change in resistance in each of four active arms*. (This is RDB specified subcarrier bandwidth)
Frequency Response: Flat within ±2.0% from DC to 10% of bandwidth.
Linearity: Within 1.0% of best straight line.
Stability: Drift less than 0.5% of bandwidth (0.07% of f_o) for 8 hours at 25° C. after 15 minute warmup.
Temperature Effect: f_o changes less than 0.08% of bandwidth per degree centigrade.
Vibration Effect: 1.0% maximum noise at 10 g, 20 to 1000 cps.
Supply Voltage Effect:
Plate Supply: Drift does not exceed 1.0% of bandwidth for ±10% change of plate supply voltage.
Heater Supply: Drift does not exceed 1.0% of bandwidth for ±10% change of heater voltage.
Output: 1.5 volts rms into 100 kilohms resistive load. Generator impedance 750 kilohms.
Harmonic Distortion: 2.0% maximum.
Power Requirements:
0.015 A at 108 volts DC
0.800 A at 6.0 volts DC or rms AC.
Bands of Operation: Standard RDB bands 1.7 through 14.5 kc*.
Size: 4.5" long x 1.45" wide x 1.35" high; occupies 2 sections of Bendix TJS Component Mounting Assembly.
Weight: 0.4 pounds.

*Available for other bridge impedances, sensitivities, and bands of operation on special order. For temperature measurement, ±0.5% change of resistance in one arm produces ±7.5% change of f_o.

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as the seasons dictate. If heavy oil is used in the winter, however, crankability problems may be encountered.

• **Oil dilution.** If oil dilution is used, P&WA exhorted its listeners to "Get that gas out of the oil before you take off." To do this, get oil temperature well up—around 50-60 deg.—before taking off. If gas is left in the oil, gallons of lubricant may spew out of the breathers as soon as full power is applied.

Broken exhaust studs. Painting iodine on broken exhaust studs is a good way to get them out, the meeting was told. But get every trace of the iodine off the metal, otherwise you are in for corrosion trouble. A good material to put on the male threads during installation to facilitate removal in case of breakage is Fel-Pro, made by a Chicago firm, P&WA advised.

• **Silastic.** Silastic fin material is doing a good job in alleviating cooling fin breakage.

• **Ignition analyzers.** All airlines who have used ignition analyzers, on the ground or in the air, think that they are a sound investment, say P&WA engineers; by greatly simplifying and speeding up trouble shooting, they pay for themselves in a remarkably short time.

• **Engine stoppage.** All airlines are faced with the necessity of stopping engines in flight to simulate engine out conditions during pilot training. Two methods are generally used—pulling back the throttle or moving the mixture control to the idle cut-off position.

P&WA says it understands the necessity of killing engines for pilot training. But it shudders to think of the consequences when using the mixture control.

Shutting off the mixture does these undesirable things: It suddenly stops a rapidly moving column of liquid (the fuel), which is hard on the carburetor fuel diaphrams; and red-hot exhaust valves with temperatures as high as 1,600F are instantaneously doused with drafts of cold air. Sudden chilling makes for trouble.

▶ **Airwork Progress**—Airwork's Gillespie cited figures to show that his company was marching ahead in its chosen field of aircraft engine and accessory overhaul.

• **Sales.** For 1949, total sales of services and parts was $1.4 million. For 1953 (the fiscal year closed July 31) the corresponding figure exceeded $5 million.

• **Inventory.** For 1949, inventory stood at $230,000. In 1953, figure surpassed $1 million.

New equipment recently installed in Airwork's plant in Millville includes a new valve facer; new, much-larger-capacity cylinder heating oven; new fixture for power-reaming exhaust valve guides and a new d.c. Magnaflux machine to be used with the a.c. Magnaflux unit already in operation.

The accessory overhaul shop doubled in size last year. In August, it turned out a total of 865 overhauled units.

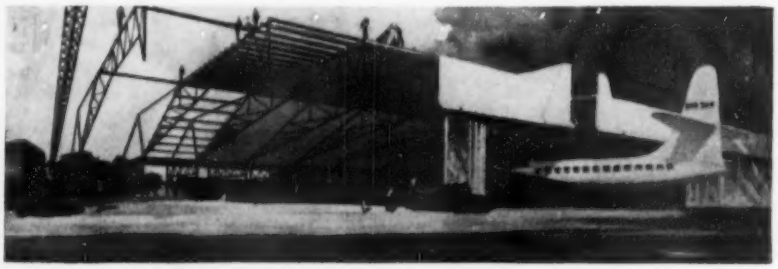
Los Angeles Airport Plans to Build Hotel

Los Angeles—The Airport Commission has drawn up specifications for a hotel at Los Angeles International Airport.

Bids for construction and operation of the hotel will be received until Nov. 10, according to commission president Ralph P. Cousins.

Cousins says the hotel is needed for the convenience of airline passengers, flight crews and business visitors to industries near the airport.

Specifications call for not less than 250 rooms, a restaurant, cocktail lounge, swimming pool and retail shop on a five-acre site.



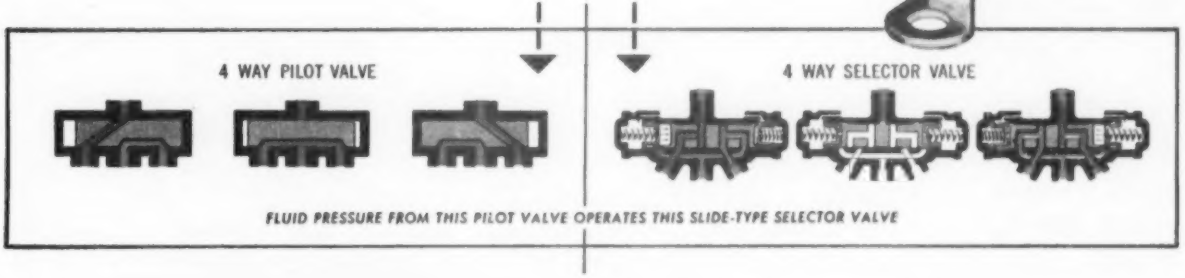
UAL GETS SET FOR NEW TRANSPORTS

New $5-million 178,000-sq. ft. hangar being constructed for 1955 occupancy by United Air Lines at New York International Airport will provide 20% more floor space than comparable buildings. The hangar will be able to handle 10 of the largest aircraft "in existence now or in the foreseeable future," company officials say. The truss split atop the hangar bays will enable the building to accommodate aircraft with very high tails. Cantilever construction is used and floor columns eliminated in the hangar. A 43-acre tract at Idlewild has been set aside for the structure; plans also include a 33,600-sq. ft. office building and a 600-car parking lot. United has signed a 20-year lease with the Port of New York Authority, which is putting up the building.

smaller..

lighter..

. . . and it does not leak



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hi-g electro-hydraulic selector valves

General Controls AV-14 Series electrohydraulic selector valves guarantee positive control of high-pressure and high flow hydraulic systems. The pilot valve, balanced by opposing continuous duty solenoids, positions the selector valve by directing fluid to one end of the slide and returning it at the other. This double balance permits maximum efficient control with minimum current drain. Compact and light weight, with specially hardened and optically ground sealing surfaces that approach "zero" leakage. General Controls Hi-g selector valves provide leakproof control of all fluids at pressures ranging from 150 to 3000 psi. For complete information on the AV-14 Series, the AV-16 Gate Valve Series and Hi-g Limit Controls, send for your copy of Catalog 53A today.

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NEW AVIATION PRODUCTS

New Radar Operator Chair Offers Versatility, Comfort

A new radar operator chair, Model 615, is being offered by Hardman Tool & Engineering Co.

The chair has a 360-deg. swivel movement with 15-deg. increment stops. It permits a 5-in. vertical travel with 1-in. increments, and reclines from 12 deg. to 38 deg. off the vertical position.

It is track-mounted. The adjustable arm rests permit 5-in. up and down movement with 1-in. increments.

Both seat and back cushions are padded with airfoam rubber and are furnished with molded contours for kidney support.

Hardman says the unit fully complies with CAR-04B requirements.

Hardman Tool & Engineering Co., 1845 South Bundy Drive, Los Angeles 25, Calif.

Fuel Cell Fastener Eliminates Wall Piercing

Waldes Kohinoor, Inc., has come up with a new snap-type fastener for holding aircraft fuel cells in place without piercing the cell wall on installation.

Called the Waldes positive lock fastener, the device was developed in cooperation with the Aviation Products Division of the fuel cell department of Goodyear Tire & Rubber Co.

It consists of three major components: a stud sub-assembly which is fitted to the outer wall of the fuel cell; an aluminum washer that acts as a bearing surface for the stud sub-assembly; and a housing sub-assembly, or receptacle, which may be riveted or screwed to any surface or structural member to which a part must be fastened.

Leading advantages claimed for the fastener are: elimination of the need for piercing the cell wall and with it the danger of subsequent tearing or leakage; stronger locking qualities; freedom of stud sub-assembly to "float" within the washer opening ¼ in. in any direction, making less critical the working tolerance required in the fuel cell installation; and a lesser requirement for rivets or screws to hold the housing sub-assembly in place.

In a typical application of the fastener, the stud, made of stainless steel, is riveted to an aluminum backplate. A patch, made of the same material as the cell wall, is sealed in a desired position to the outer wall of the fuel cell. Stud assembly is placed on the patch with aluminum washer centered over stud. Another patch, with a hole cut in the center corresponding to the washer opening, is then sealed to the washer and the adjacent edges of the first patch.

When the stud sub-assembly and the housing sub-assembly are engaged, a retaining ring locks them together. When the two parts are joined, an audible

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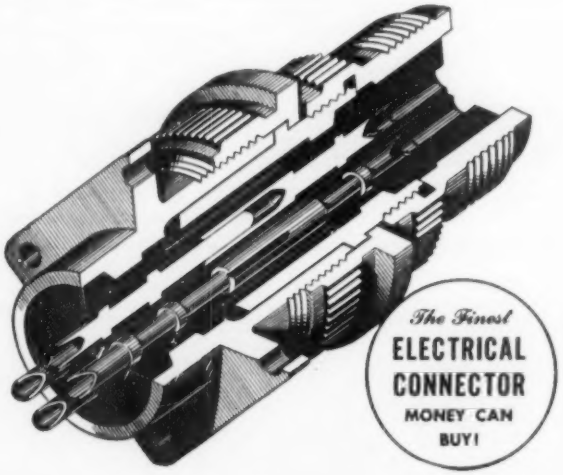
When operating conditions demand an electrical connector that will stand up under the most rugged requirements, always choose Bendix Scinflex Electrical Connectors. The insert material, an exclusive Bendix development, is one of our contributions to the electrical connector industry. The dielectric strength remains well above requirements within the temperature range of −67°F to +275°F. It makes possible a design increasing resistance to flashover and creepage. It withstands maximum conditions of current and voltage without breakdown. But that is only part of the story. It's also the reason why they are vibration-proof and moisture-proof. So, naturally, it pays to specify Bendix Scinflex Connectors and get this extra protection. Our sales department will be glad to furnish complete information on request.



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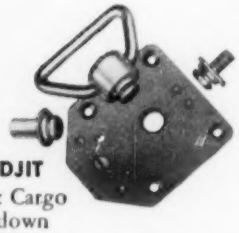

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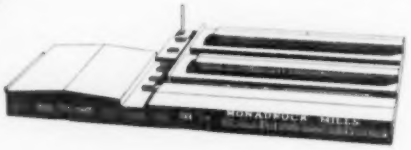

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clicking sound is heard indicating positive locking.

Disengaging is accomplished by pushing the stud down into and then up toward the open end of the housing. This causes a locking spring to be compressed and the stud may be shifted out of the retaining ring which holds it.

Waldes Kohinoor, Inc., 47-16 Austel Place, Long Island City 1, N. Y.

Heat-Sensing Valves Stop Vacuum-System Fires

Two heat-sensing valves, one of which reacts to outside temperatures, the other to internal heating, have been developed to stop or prevent spread of fires originating in aircraft vacuum systems. Santa Anita Engineering Co. is the manufacturer.

The first Model 40-100, is reportedly interchangeable with a special tee fitting currently used in the Constellation vacuum pump system. Overheated air or fluid causes an internal fusing element to shut off the valve, preventing further flow downstream. The fuse is exhausted to the atmosphere. The other valve Model 40-200 has external fusing and shuts down when fire spreads to the area. Each valve weighs .75 lb.

SAEC points out that vacuum system fires have been the subject of study by aircraft analysts for the past six years. The company believes that this valve meets the requirements the analysts have set forth for an effective fire prevention device. It has been successfully tested by leading airframe manufacturers, SAEC reports.

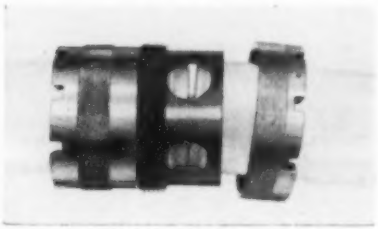
Santa Anita Engineering Co., Pasadena, Calif.

New Flexible Coupling Saves Weight in Jets

A new coupling that transforms metal tubes into flexible assemblies at a considerable weight reduction is now being installed in jet aircraft at Lockheed, North American, Douglas, Chance Vought and Grumman, its manufacturer, E. B. Wiggins Oil Tool Co., reports.

Main application for the coupling, according to Wiggins, is in aircraft fuel, air, oil, fire extinguisher and general plumbing lines.

► **Advantages**—The leading advantages



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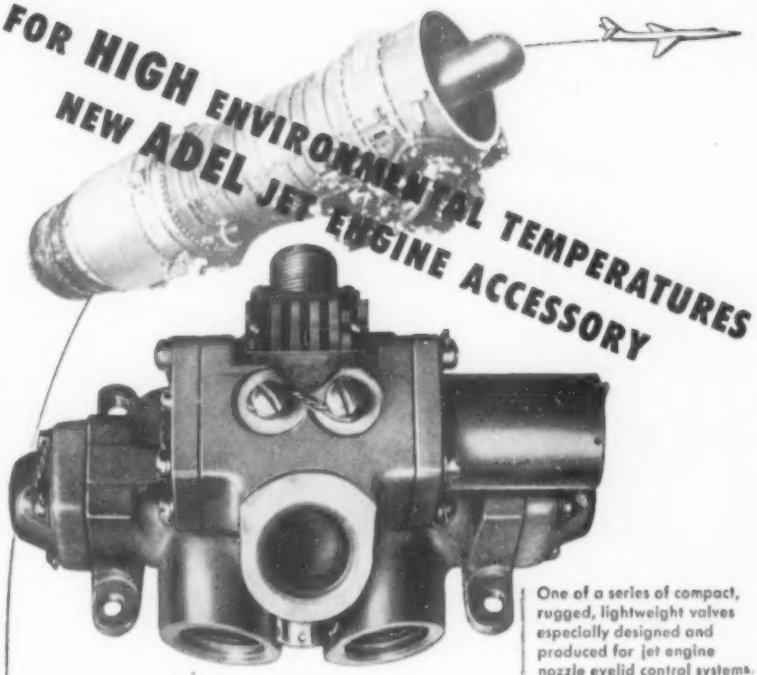

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B Solenoid energized, 3000 psi at inlet port produces outflow at cylinder 1—cylinder 2 open to return.

C Solenoid de-energized, produces outflow at cylinder port 2, cylinder 1 open to return.

CHARACTERISTICS

1 Ambient temperature range −65° to +350°F.
2 Operating pressure 3000 psi.
3 Ports per AND10050 are available in 1/4", 5/16", 3/8", and 1/2" tube sizes.
4 No packing on sliding members.
5 Operating voltage 18-30 VDC.
6 Current required 1.0 amp. at 30 volts.
7 Continuous duty solenoid.
8 Pilot valve spring loaded against pressure to 4000 psi min.
9 Operating fluid MIL-L-7808.
10 None interflow type valve.
11 Weight 1.75 lbs.

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the problem: The electronic brain which guides a guided missile is as delicate as it is complicated. One of the major problems, therefore, which faced missile engineers was how to protect this sensitive mechanism from the violent shock and vibration set up by the missile at take-off and in flight.

the solution: Since conventional types of shock-mountings proved to be inadequate, Robinson engineers were called in to find a solution. After careful study and intensive laboratory work, Robinson developed a special multi-directional mounting that reduced vibration and shock to such a marked degree that the missile's guidance system was free-floating and thus dependable. Today, these mountings are in quantity production at the Robinson factories . . . *and reliability now rides the rockets!*

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*Met-L-Flex is the copyrighted designation for the all-metal resilient cushions developed and pioneered by Robinson.

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claimed for the unit, known as Wig-O-Flex, are:

• **Weight reduction.** It is 80% lighter than other standard connections. Manufacturer states that in one instance use of the coupling on a new type bomber reduced its weight by more than 17 lb.

• **Saves space.** Unit can be installed in much smaller apertures in aircraft structures.

• **Handles misalignment.** The coupling is capable of taking care of misalignment to $\frac{1}{8}$ in., tube separation to $\frac{1}{4}$ in. and allows at least 4% tube flexure.

The unit reportedly cannot blow apart because its design provides metallic retention of the tube ends. This union serves as a slip joint or functions as a packing gland.

It assembles on standard tube beads, and requires only standard O-rings. According to the manufacturer, this new sleeve-and-O-ring type fitting has shown itself in tests to be leakproof even at three times the pressure encountered in current jet aircraft. It is said to maintain a tight seal at temperatures ranging from −65F to about −600F.

E. B. Wiggins Oil Tool Co., Inc., 3424 East Olympic Blvd., Los Angeles 23, Calif.

Safety Lid on Dip Tank Prevents Solvent Fires

A fire preventive dip tank, featuring foot treadle control, is being offered by the Protectoseal Co. The unit is used for washing castings, parts, assemblies and similar moderate-size production pieces.

Designed for convenience of the user, the tank is waist high to avoid the necessity of bending. Because of its fire preventive construction, it may be placed safely beside the worker or at any other location in the plant without fear of mishap, Protectoseal claims.

Construction is of heavy terne plate, electrically seam-welded into a "one-piece" unit that is mounted onto a welded angle iron frame. The hinged cover is self-closing and the tank remains covered to protect the cleansing solvent from fire or contamination, and to minimize loss by evaporation.

The unit can only be used when the

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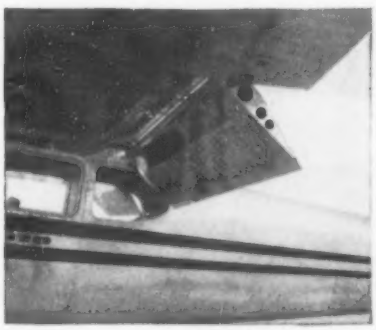

"PARA-LIFT" FLAPS reduce landing speed a good 10%, slow plane's rate of descent to only 500 ft. per minute, permit use of many short landing fields.

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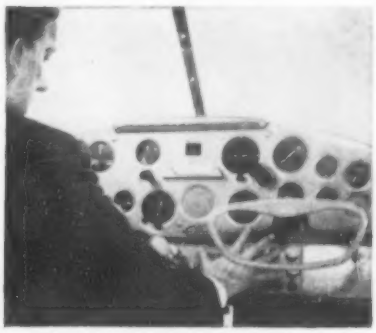
120-LB. BAGGAGE CAPACITY plus plenty of cargo space. By removing the rear seat (in 6 minutes, 57 seconds) you can load a quarter-ton of cargo in the 170.



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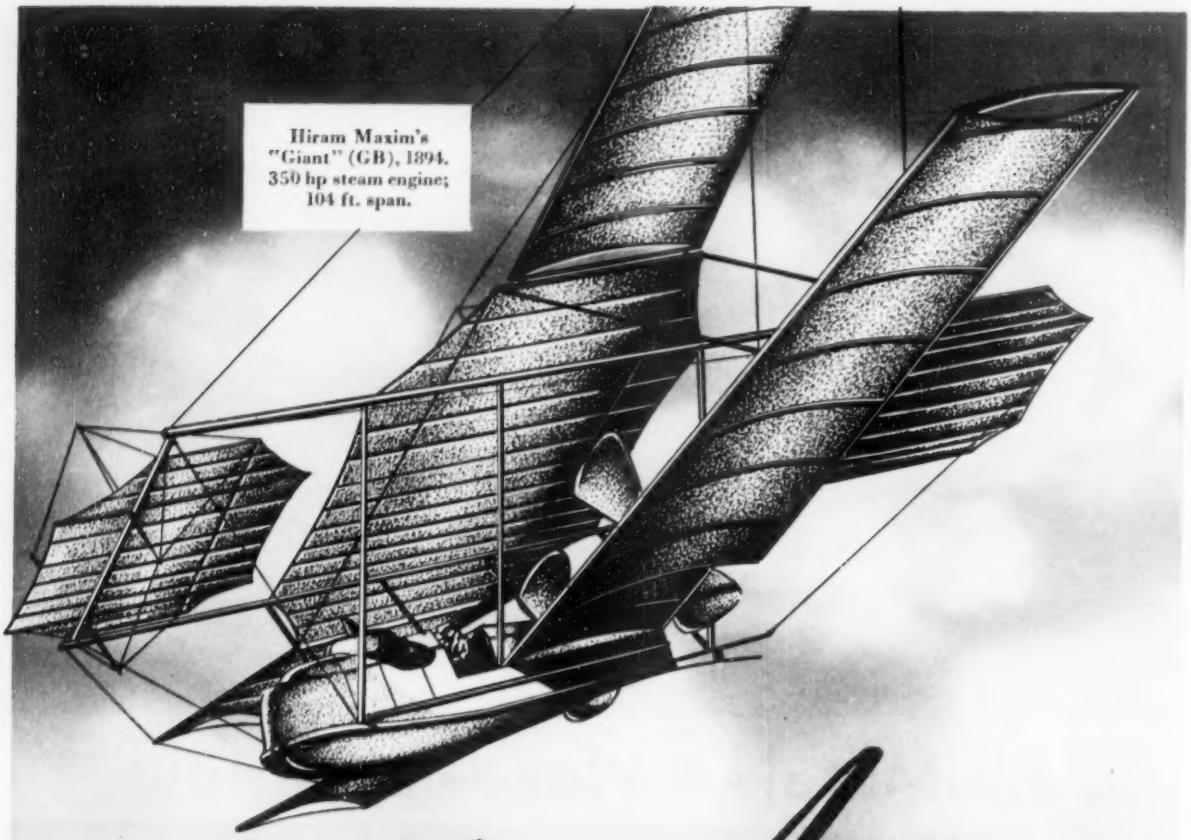
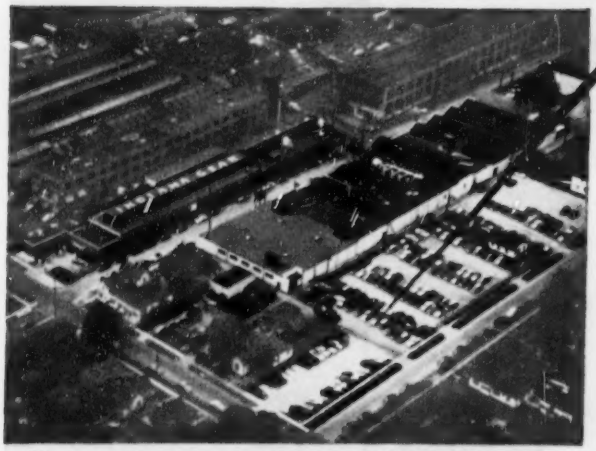


Hiram Maxim's "Giant" (GB), 1894. 350 hp steam engine; 104 ft. span.

...out of this came Aviation



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operator's foot is on the treadle; when pressure is removed the cover closes immediately.

Operation of the tank is said to be quick and simple. Workman carries part to the tank, steps on treadle, washes part, releases treadle and cover closes. Manufacturer emphasizes the time-saving element and the fact that no waste motion is involved.

Should a fire occur in the flammable solvent while operator is cleaning parts, closing of the cover will quench flame instantly.

Unit measures 13 in. wide by 24¼ in. long by 8¼ in. deep. It stands 33 in. from the floor. Working capacity is 8 gal. of cleaning solvent. Manufacturer states that tank is approved by Factory Mutual Fire Insurance Companies Laboratories.

Protectoseal Co., 1920 South Western Ave., Chicago 8, Ill.

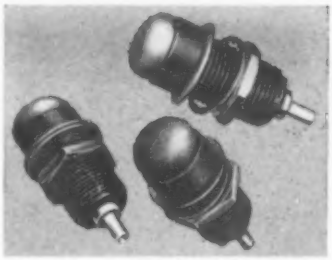
ALSO ON THE MARKET

Edge-lighted instrument panel, called Dialglo, is made by engraving through a .004-in. black vinyl thickness onto a .008-in. white lamination. The two layers cover a plastic core which, when illuminated through a red filter, transmits a uniform red glow to all parts of the white vinyl. Exposed calibrations appear clear white against black during normal daylight use and register red when source of illumination is in operation.—Ackerman Engravers, 458 Broadway, New York 13.

Insert power bit for production screwdriving is cold forged with heat treatment of shock resistant tool steel for longer surface wear. Bits are designed in two grades—"tough" for aircraft industries and "hard" for use with self-tapping screws. Both are manufactured in all size ranges and are designed for use with existing adaptors, either retainer ring or magnetic type.—Zephyr Manufacturing Co., Inglewood, Calif.

Hermetically sealed relay, solenoid type, is rated for continuous duty operating cycles 50,000 minimum. Contact rating is 25 amp. resistive, 20 amp. inductive, 15 amp. motor. Unit has nominal voltage of 24-28 v. d.c. Weight of the unit is 6¼ oz., width is 1⅛ in., length 1⅛ in., and height 2¾ in.—Electrical Products Corp., 1100 North Main St., Los Angeles 12, Calif.

Dry lubricant has penetrative powers to diffuse into preparatory surface coatings, and creates a lap-in action in rubbing surfaces which assures long-life lubrication, according to manufacturer. Green in color, it can easily be identified by inspection departments and not



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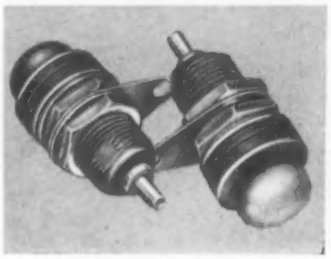

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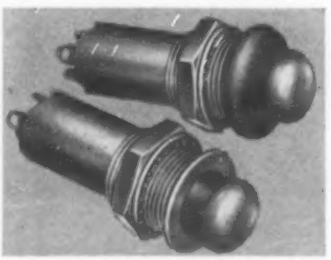

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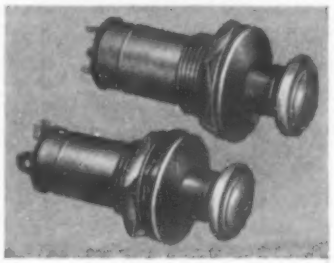

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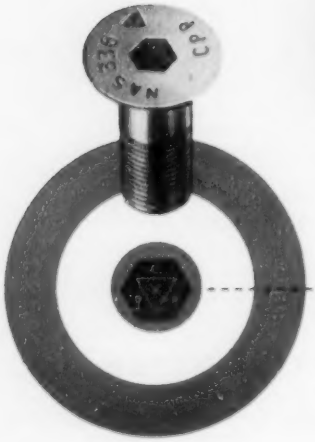

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be confused with existing gunmetal finish coatings. It is said to have excellent oil retention properties, is unaffected by solvents and has good abrasion resistance.—Everlube Co., 4435B San Fernando Road, Glendale, Calif.

Microvolt signal generator, Model 292-XAL, provides complete coverage of the aircraft band including all necessary IF frequencies and all RF frequencies with calibrated output. Claimed to be the only unit of its kind to give continuous coverage from 125 kc. to 165 mc. on fundamentals, it can be externally modulated from 15 to 10,000 cps., and measures both input and output of units under test; maintains dependable and accurate frequency calibration, is free of wave distortion and has no spurious signals in the output system, according to the producer.—Hickok Electrical Instrument Co., 10514 Dupont Ave., Cleveland 8.

Trend in press punching is toward standard self-contained hole-piercing units with punch and die built in. This speeds setup and reduces need of custom dies. New hole punching units of this type can be mounted in press bed

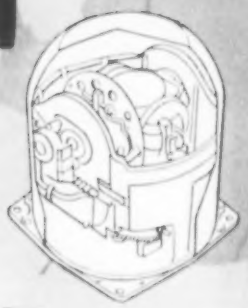
in any desired pattern by bolting to template or locking in T-slotted plate. Press head serves as striking surface, driving the free-floating punch into the die. Horseshoe-shaped holders accommodate several punch and die sizes.—Toolset Div., General Riveters, Inc., 777 Hertel Ave., Buffalo 7, N. Y.

Portable pneumatic riveter, featuring rotating impact, tends to feed itself. Spinning action eliminates extreme jumping; tool easily gets into hard-to-reach places and unusual positions. Riveter can make short pilot run jobs, saves on handling and set-up time, speeds up production, according to manufacturer. It can be used on fragile as well as ordinary materials, contains only 26 parts, weighs 7 lb., measures 15 in. in length.—Lemert Engineering Co., Inc., Plymouth, Ind.

pushing precision toward perfection

Eclipse-Pioneer's "Polar Path" system guided the first commercial over-the-Pole flight* with such accuracy that the log of the now-famous Scandinavian Airlines System's flight carried the notation "works to a miracle". How was it possible to produce this gyro that actually proved to have less than 1° random drift? Admittedly, it was a special gyro, but the answer nevertheless lies in advanced production techniques and facilities that are pushing gyroscope precision toward perfection. Today, *even machining* of gyro parts is being accomplished at E-P in a specially constructed, atmosphere-controlled room where castings "soak" for 36 hours to assure stability of carefully machined tolerances—where electronic air cleaners snatch up foreign particles so fatal to delicate mechanisms—where specially constructed machines automatically hold split-hair tolerances as a matter of routine and surface finishes are maintained to the incredible limits of the thickness of a single light band. In the entire industry, only Eclipse-Pioneer can offer precision mass-production facilities like these—facilities that literally are pushing gyro precision toward perfection.

*NOVEMBER 20, 1952



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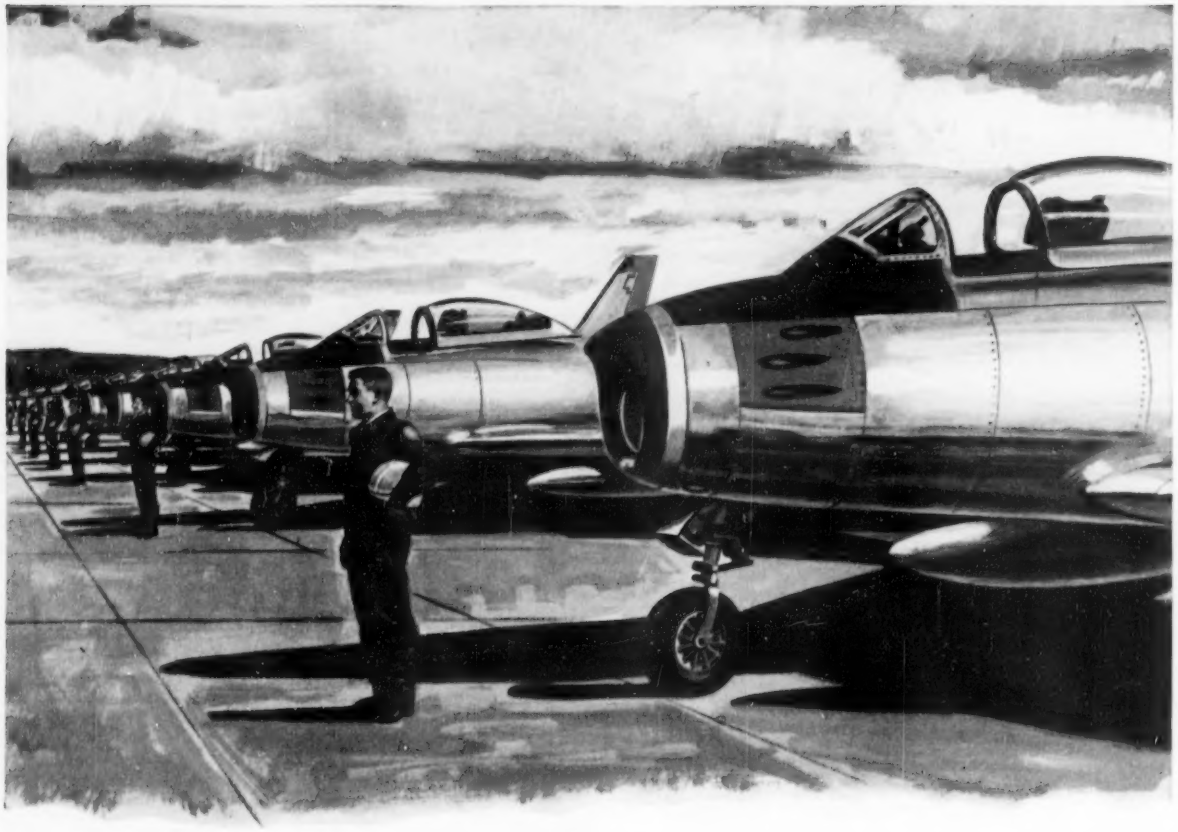

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CA52-17UST

American Blocks Airfreight Tariff Boost

- **CAB hearings forced on proposed increase.**
- **Board says cargo lines barely break even now.**

The 12% average airfreight rate increase proposed by all-cargo carriers and Civil Aeronautics Board last week ran into a barrier set up by American Airlines.

American was the only airline that filed objections to the proposed tariff boost, forcing the Board to conduct hearings. This probably will delay adoption by a few months.

The cargo lines and CAB agree that all-cargo operations barely break even at present rates. But American's mixed cargo-passenger operation yields lower costs and higher revenues. This enables the carrier to hold rates at the present rock-bottom level, simultaneously boost volume to fill excess plane capacity and squeeze profit margins of its competitors.

▶ **New Structure**—CAB agreed with Slick Airways and Flying Tiger Line that all-cargo operations need a rate increase. The Board therefore issued a show-cause order proposing a 25% raise in minimum tariffs. This would raise the average only about 12% because most rates already are substantially higher than the tariff floors.

Proposed new structure:

- **20 cents a ton-mile** on the first 1,000 ton-miles of any one shipment.
- **16.25 cents a ton-mile** beyond the first 1,000 mi. of any one shipment.
- **Increase all other minimum rates** and below-minimum directional rates to maintain their former percentage relationship to the new base.

CAB says the new structure "will seldom force an effective rate increase exceeding 12%, and in many cases the required increase will be less."

▶ **Slick vs. American**—Slick filed the original rate-raise petition, saying costs had climbed and that the company was losing money despite extremely high load factors.

These actions followed:

- **The cargo carrier** said it had tried twice before to raise rates, along with three of its principal competitors, but in each case American refused to go along. This held competitive rates close to the CAB-fixed floors.
- **Flying Tigers** submitted a memorandum backing the petition and saying AA's rates on non-competitive routes are higher than the increased tariffs sought by Slick would push rates on competitive routes.
- **American** filed the only answer to Slick's petition.

CAB says of AA's objection: "This answer does not controvert Slick's allegations that the costs of carrying airfreight have increased sharply."

▶ **Critical Stage**—American, the Board says, bases its objections on the fact

Cargo Plane Costs

(Per available ton-mile*)

Plane type and airline	Direct flight cost only	Total cost
Curtiss C-46:		
Flying Tiger	8.74 cents	13.09 cents
Slick	8.69	14.58
Average	**8.71 cents**	**13.83 cents**
Douglas DC-4:		
TWA	11.83 cents	N.A.
United	13.12	N.A.
American	9.05	N.A.
Average	**11.33 cents**	
Douglas DC-6A:		
Slick	10.72	17.52
American	N.A.	N.A.

* Reported operating expenses per available ton-mile on all-cargo service the 12 months ended June 30.

NOTE: DC-6A costs were inflated by the expense of inaugurating this new type equipment.

Airfreight Boom Forecast

Despite the outlook for a 10-15% rate increase, airlines foresee a continued rapid rise in airfreight.

Emery Johnson, vice president and general manager of the scheduled airlines organization, Air Cargo, Inc., forecasts:

"A record-shattering 275 to 300 million ton-miles of airfreight will be carried by U.S. domestic airlines during 1953 if present business trends continue.

"In performing this unprecedented industrial and business airlift—more than 21 times the volume of the first postwar year, 1946—the youthful U.S. airfreight industry is continuing an expansion which has been uninterrupted every year of its existence. . . ."

"Yet despite its rapid growth, future air cargo potential is virtually unlimited—as attested by the fact that 1953's airfreight business still will account for only about one-tenth of one percent of the nation's total freight movement. . . ."

Rapid delivery of many types of goods (more than 1,000 types) provides greater profits to sellers and significant savings to buyers, Johnson writes in the current issue of Planes, because it permits merchandisers to:

- **Increase turnover.**
- **Maintain lower inventories.**
- **Reduce warehousing and packaging costs.**
- **Minimize markdown losses.**
- **Prevent obsolescence and deterioration.**
- **Expand sales volume by opening new markets.**

"Because distribution costs account for about 59 cents of the consumer prices on most products," he says, "the nation's businessmen are turning increasing attention to marketing efficiency and to distribution cost accounting."

that its own costs are lower than those of the all-cargo carriers. CAB notes that the passenger line's argument is that "it can, through the use of combination aircraft, carry freight cheaper than the all-cargo carriers and the Board should consider this factor in fixing the minimum rates."

AA also argues, CAB reports, that "airfreight is in a critical developmental stage with a critical need for volume growth, that volume was developed to a lesser extent than anticipated at the time of the minimum rate order, that American is adding substantially to its all-cargo fleet and that the increase in minimum rates proposed by Slick would not be consistent with the objective of developing the airfreight volume required by the new capacity."

► **Serious Doubt**—The Board's show-cause order and tentative opinion says CAB in its previous minimum rate order "determined that the proper development of airfreight required that minimum rates be based on attainable costs in all-cargo planes."

The Board adds: "This decision obviously must have been among the important considerations in certificating several all-cargo carriers . . . for without such a rate basis there would be serious doubt that all-cargo carriers could survive in competition with carriers hauling all or part of their freight in combination planes. . . .

"The financial reports of the two major all-cargo carriers indicate that Flying Tiger is barely breaking even on their scheduled freight operations, while Slick appears to be suffering substantial losses.

"In the case of Slick, at least, it appears that the need for prompt rate relief is urgent."

If a carrier answers this show-cause order "raising issues as to the costs of carrying freight in all-cargo planes," CAB says it will hold rapid hearings to settle the new rate as soon as possible.

Western Builds New Airport Terminal

Portland, Ore.—City officials have approved construction of a 4,000-sq. ft., $75,000 Western Air Lines passenger terminal at Portland International Airport.

Western officials say plans include construction of a building adjoining the present Northwest Orient Airlines office and installation of passenger service facilities. The building, to be completed within three months, will be constructed by Henry M. Mason and Co. Architectural firm is Wick & Hilgers.

Western will continue operation of its ticket and sales office in downtown Portland.

Pioneer Reorganization

Comparative Balance Sheets
(June 30, 1953)

	Old Pioneer	New Pioneer	New separate company
		(000 omitted)	
Current assets	$1,201	$809	$392
Operating property	3,499	147	3,352
Non-operating property	50	50	———
Deferred charges	180	180	———
Total assets	**$4,930**	**$1,186**	**$3,744**
Current liabilities	1,846	526	1,320
Long-term debt	1,380	0	1,380
Equity capital	1,704	660	1,044
Total liabilities	**$4,930**	**$1,186**	**$3,744**

Source: Pioneer Air Lines pro-forma balance sheet submitted for CAB approval of corporate split-off of its nine Martin 2-0-2s.

PAL Sets Up 2-0-2 Subsidy

Pioneer Air Lines has won Civil Aeronautics Board approval to set up a separate company owning its retired Martin 2-0-2s, thereby greatly simplifying its financial structure.

Stockholders will receive shares of the new firm, Pioneer Aeronautical Services, Inc., in proportion to their ownership of PAL stock. New company may own, charter or sell the 2-0-2s.

Pioneer will continue to fly leased DC-3s on its routes. The mail rate of $1 million a year set by CAB last spring does not change. It was insufficient to maintain Martin operation, and therefore forced Pioneer to phase out the Martins, as was CAB's intention.

The airline will lease its DC-3s from Leeward Aeronautical Services and Leair, Inc. Pioneer temporarily chartered some of its DC-3s from Eastern Air Lines.

The carrier had a net operating loss of about $1 million on its Martin service in the 12 months ended July 31. Net worth per share dropped from $14.60 in July of 1952 to $10.33 last June and $9.80 last July.

The Board's opinion approving Pioneer's "spin-off" recapitalization says "profits realized on the sale of the original DC-3 equipment, losses attributable to Martin 2-0-2 operation and profits, if any, from future sales of Martin 2-0-2 equipment would not change the carrier's recognizable mail pay requirements, since they have been determined under the assumption of continued operations with the original DC-3 equipment."

Therefore, CAB says, no other airline should plan to use this "in order to exclude 'all other revenues' from the computation of recognizable break-even need for mail rate-making purposes."

Following the stock issue, Pioneer will have:

- **Route certificate.**
- **$1-million subsidy.**
- **Net worth $1,186,000** as of last June 30, pro forma.
- **Debt of $660,000,** same date.
- **Working capital,** current assets less current liabilities, of $283,000, same date.

MATS Forms Five New C-124 Units

Atlantic Division of Military Air Transport Service will add five new heavy transport squadrons at Dover AFB., Del., by March of next year.

Surplus Douglas C-54s and C-124 Globemasters from other MATS squadrons will make up the new units that are slated to average 10 aircraft.

C-54s will serve only as interim aircraft until sufficient Globemasters are built to replace the older transport. Eventually MATS will operate but one C-54 squadron.

In addition to the five new squadrons scheduled to operate from Dover's $50-million base, four more will be transferred from the 1600th Air Transport Wing at Westover AFB, Mass. That base gradually will be turned over to the Strategic Air Command early in 1955.

The Dover field is nearly completed following considerable expansion to turn the World War II training base into one of two Atlantic Division East Coast bases. The other is McGuire at Ft. Dix, N. J. These two bases will assume the functions of Westover, present division headquarters.

BEA Cites Overhaul Costs for Viscounts

After five months of operation with the turboprop Vickers Viscount, British European Airways reports the eight transports have flown 1,630 revenue flights for 4,150 revenue hours.

These figures were revealed by BEA's Lord Douglas at a New York press conference last week. The BEA board chairman said the Viscounts have flown one million revenue miles, carrying a total of 41,470 passengers.

Passenger load factor for the period was 76.1%, with an overall load factor of 55.6%.

▶ **High Overhaul Cost**—"On the whole," says Douglas, "we have been most satisfied with the Viscount performance. So much so that we have 38 additional aircraft on order."

His only complaint is the high overhaul cost on Viscounts. He hopes this will be reduced considerably over an extended period. BEA presently is putting 500 hr. on each aircraft between overhauls.

▶ **Tax Dodger**—Douglas revealed that the Viscounts will be pressed into service on the Belfast-Glasgow run Oct. 15.

Reason for this, he says, is to dodge the high gasoline tax imposed by the British government. Viscounts run on kerosene.

Eventually, the British line wants to operate Viscounts on most of its longer domestic routes, "unless the government devises a tax for kerosene." The board chairman said BEA has paid out more than $1,120,000 in petrol taxes this year. "On the present Belfast-Glasgow run, our first six passenger fares go for petrol taxes."

▶ **Tourist Boost**—Douglas indicates that BEA's 27% rise in traffic this year was due in large measure to the tourist trade.

He feels, however, that airlines have gone overboard on coach flights and reveals plans to inaugurate additional first-class service this month to Lisbon and Gibraltar via Madrid and to Malta via Nice.

▶ **Copter Plans**—BEA's top executive says his airline hopes to get a prototype of Bristol's 173 helicopter soon, but he indicates that the manufacturer is having vibration trouble with the larger copter.

At present, BEA owns three Bristol 171s, single-rotor, single-engine, three-passenger copters.

Douglas reveals plans for inauguration of copter passenger service from Norholt and Heathrow Airports into London.

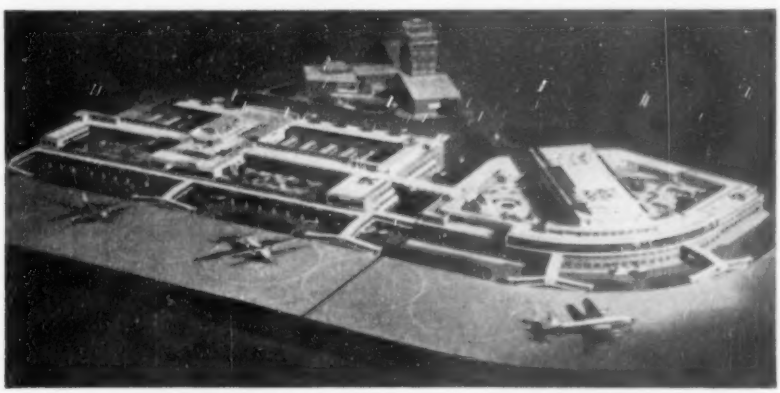
▶ **London-Paris Shuttle?**—He declines comment on rumors of proposed copter service between London and Paris. Douglas says, however, that the Ministry of Civil Aviation is considering five helicopter designs in its search for a suitable twin-or multi-engine rotary plane capable of carrying 35 to 40 passengers at a speed of 150 mph.

Such a copter would be suitable for a London-Paris run.

In the meantime, BEA probably will take six Bristol 173s in order to fill the gap.

The 14-passenger 173 is not large enough to be economical, according to Douglas, but plans have been made for lengthening the fuselage to allow for an additional four passengers.

Main problem to be solved before BEA will begin any copter service, Douglas says, is a suitable flotation device for the aircraft. But a design is expected in the near future.



TERMINAL PLANS FOR LONDON AIRPORT

Terminal building arrangement slated for construction at the new London Airport is shown in model form. The buildings, designed by architect Frederick Gibberd, comprise three main structures: the passenger handling building and eastern apex building (left and right respectively, foreground) and the control building (rear). The structures will cover 158 acres. In operation since 1946, London Airport is scheduled for completion in 1956 at a total cost of nearly $60 million.

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1004 **E. Broadway, Hawthorne, Calif.**

CAB ORDERS

(Sept. 21 to 27)

GRANTED:

Sabena Belgian Airlines foreign air carrier permit amendment adding Manchester, England, to its Brussels-Shannon-Gander-New York route. Board also corrected typographical error in Sabena's full corporate name on original permit to read: Societe Anonyme Belge d'Exploitation de la Navigation Aerienne (Sabena).

Northeast Airlines permission to serve Rutland, Vt., Fitchburg, Mass., and Woonsocket-Pawtucket, R. I., as allowed by NEA certificate.

Continental Air Lines route renewal case intervention by Alamogordo, N. M., and the city's chamber of commerce.

Bonanza Air Lines route renewal case intervention by California Aeronautics Commission, San Francisco Chamber of Commerce and Riverside, Calif.

Ozark Air Lines route renewal case intervention by Coffeyville, Kan., and its chamber of commerce.

Lake Central Airlines permission to continue serving Kokomo-Logansport-Peru on Segment 2 of its Route 88.

Bonanza Air Lines route renewal case consolidation of Southwest Airways request to serve Inyokern-Los Angeles and San Jose on its Reno-San Francisco route.

Continental Air Lines temporary route case consolidation of its service to Alamogordo and Carlsbad, N. M., and El Paso, Tex.

Pioneer Air Lines permission to set up a separate corporation to own, charter and/or sell its Martin 2-0-2s now replaced by chartered DC-3s on Pioneer routes.

U. S.-Alaska route case intervention by seven parties.

Delta-C&S Air Lines international mail rate estimated to yield subsidy of $730,000 per year and $62,000 compensatory mail pay. This is 6% less than the total subsidy and mail pay of $840,000 set by CAB for the same operation before the Delta-C&S merger, credited by the Board for the new reduction.

APPROVED:

Existing tariffs between Alaska, Portland and Seattle, including: identical rates to Portland and Seattle; scheduled airline coach rates of $75 Seattle-Anchorage and $90 Seattle-Fairbanks, and nonsked rates of $65 and $69 on same routes, respectively; Northwest Airlines Stratocruiser fare of $105 Seattle-Anchorage (but $90 off-season rate disapproved); reduced passenger fares on southbound cargo flights.

Routine inter-airline agreements between 13 groups.

Civil Aeronautics Board's previous proposal of domestic non-subsidy mail rate to Delta-C&S of 53 cents per ton-mile. Certain findings and conclusions are amended in the new order, updating financial data. Board continues to oppose Post Office Department's request that CAB apply company's domestic earnings of more than 8% return on investment to help offset international subsidy need. Board forecasts domestic company net earnings of $2,757 for a typical future year.

Experimental low rates for carriage of first-class mail on Chicago-New York and Chicago-Washington flights by American, Capital, TWA and United. There were no objections (AVIATION WEEK Sept. 28, p. 20).

STARTED INVESTIGATING:

Routes of Piedmont Aviation and Eastern Air Lines with a view to possible certification of one between Columbus, Ohio, and Charleston, W. Va.

DENIED:

Continental's petition for reconsideration of CAB grant of Braniff Airways nonstop Tulsa-Dallas service and Central Airlines Oklahoma City-Dallas flights via intermediate cities. Board chairman Oswald Ryan and member Harman D. Denny dissented, as they did in original decision, largely on grounds that "the award of this segment to Central rather than to Continental will require unnecessary expenditures of federal subsidy of approximately $200,000 per year."

Alaskan carrier petitions for reconsideration of CAB route decisions in Fairbanks area case and Alaska route modification case.

Muskogee, Okla., request for consideration of a Muskogee-St. Louis service in the Ozark Air Lines route renewal case.

Delta Air Lines request for immediate temporary rights to add Miami-Havana to its route system.

Allegheny Airlines request to serve Philipsburg (Pa.) airport.

Frances L. Ashby, et al. complaints against Braniff in Docket No. 6087.

DELAYED:

Effective date of Braniff's nonstop Tulsa-Dallas certificate and Central's Oklahoma City-Dallas certificate via intermediate cities. Continental asked U. S. appeals court to stay the route grants. Board has deferred effectiveness pending court decision.

DISMISSED:

Society of American Florists complaint against increased airfreight rates proposed by Flying Tiger Line and Slick Airways on cut flowers. Also dismissed other freight-rate complaints of airborne flower and freight traffic, and a United complaint against rate reduction on plastic footwear.

United Air Lines complaint against Trans World Airlines coach fares to Las Vegas. TWA canceled the proposed fares.

CAB to Hold Ceiling On Tourist Fares

Aircoach fares will not change much next year, according to present Civil Aeronautics Board plans.

The Board was preparing to issue a policy statement to this effect last week, to give airlines time for any adjustments before present rates expire Dec. 31.

A few minor changes will be proposed.

► **Fare Issue**—Airlines will go along with continuance of most of the present longhaul coach rate structure. They feel shorthaul rates should be slightly higher but are not ready to make a major issue of it.

Coach fares have been 4 to 4½ cents a passenger-mile the last two years. This

compares with 6 to 6¼ cents a mile for first-class service.

The 50% increase in number of passengers per tourist transport offsets the one-third cut in revenue per head.

CAB two years ago set up maximum tourist rates of 4½ cents a passenger-mile for day service, 4 cents on night coach.

▶ **Quarter-Cent Raise**—Some airlines seek an increase in the 4-cent night rate because day coach competition has cut load factors, and rising costs are accentuating this pinch. But the Board's staff has been firm on its hold-the-line policy, and night coach carriers plan to watch developments on the controversial shorthaul rate dispute before fighting for a quarter-cent raise.

▶ **Shorthaul Fight**—Still not settled is the question of what to charge customers on short, intermediate segments of longhaul tourist flights. CAB is investigating the American and Eastern Airlines first-class rates on Boston, New York and Washington coach flights.

American has offered to cut fares to 5¼ cents a mile, but it appears the Board is shooting for 5 cents or lower.

Hearing is slated for Oct. 12, and CAB's decision will follow a few months later.

Shorthaul trunklines are vitally interested in the outcome of this case.

SHORTLINES

▶ **Cox Municipal Airport,** Dayton, Ohio, has begun installation of high-intensity lights on the Southwest-Northwest instrument runway.

▶ **Delta-C&S Air Lines** started Convair-Liner aircoach service Dallas-Detroit last week, with rate reductions reaching 42%. . . . Company also has started nonstop Chicago-New Orleans service.

▶ **International Air Transport Assn.** reports interline transactions put through the London clearing house reached $21,740,000 in July, compared with $20,977,000 during July 1952.

▶ **London Airport** development will be completed in January 1956 at cost of $58.8 million. Present temporary facilities, opened in 1946, have served 23 airlines. The airport served 845,000 passengers last year.

▶ **Northwest Orient Airlines** reports record August traffic of 105,039 passengers —96,501 domestic, 8,538 international.

▶ **Pan American World Airways** expects to offer 'round-the-world aircoach service next spring, contingent on international agreement on a Beirut-Tokyo coach tariff.

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More Tributes To Alex McSurely

Additional tributes to Alex McSurely, associate editor of AVIATION WEEK who died last month, are being received at AVIATION WEEK offices. Some of them are published herewith.

I hope that it is in order to express my condolences to your colleagues and yourself on the death of Alex McSurely. It seems almost an era ago since we first met in the very early days of AVIATION WEEK and despite the fact that I saw him only occasionally during recent years I had always felt a growing admiration and affection for him as an aviation writer and as a human being.

While magazines must go on and his place on the staff of AVIATION WEEK will be filled, I know that his passing must leave quite a vacuum in the lives of the people who worked with him.

S. RALPH COHEN, Public Relations Officer
International Air Transport Assn.
Montreal 3, P.Q., Canada

We were very shocked to hear of Alex's death. Not only have we lost one of the most capable men in aviation, but a very good friend as well.

I do not know his family, so please pay our respects to Mrs. McSurely.

JOHN P. HENEBRY, President
Skymotive, Inc.
Chicago International Airport
Chicago, Ill.

First of all, I would like to express my sincerest regret on the passing of Alex McSurely. I know you must feel keenly his loss both as a friend and a devoted colleague. Alex was the first aviation writer I met upon setting up this public relations operation in Washington one year ago, and in that time I came to know and respect him.

JULIAN KILMAN, Manager
Washington Public Relations
Westinghouse Electric Corp.
1625 "K" Street, N.W.
Washington 6, D. C.

We were all shocked here to learn of Alexander McSurely's sudden heart attack and untimely death. His family has our most sincere sympathy.

LEWIS ZAREM, Chief, Special Events Division Chief of Staff
Headquarters, Wright Air Development Center
Wright-Patterson AFB, Ohio

All of us at Temco were deeply grieved to learn of the passing of Alex McSurely. Alex, in our estimation, was one of the most capable and respected writers connected with the aviation industry.

ROBERT MCCULLOCH, President
Temco Aircraft Corp.
Dallas 2, Tex.

We all feel with deep regret the passing of our mutual good friend, Alex McSurely. He certainly did an excellent job in covering our National Aircraft Show and the article is greatly appreciated.

BENJAMIN T. FRANKLIN,
General Manager National Aircraft Show

Every so often I find myself presuming to be so busy that I sometimes lose sight of one thing that is far more important to me than almost anything else in life—my friends. I have just lost a valued friend in Alex McSurely.

As you probably know I have been one of Alex's friends and admirers for many years. I knew him first back in Dayton when I was editor of Flying in Chicago. I quickly found him to be one of the most capable, trustworthy and best-liked aviation writers in the business. And personally, Alex was as fine a gentleman as I've known in a long time.

I feel his loss deeply.

MAX KARANT, Assistant Gen. Mgr.
Aircraft Owners and Pilots Assn.
Washington 14, D. C.

I was deeply grieved on my return from Europe to learn the sad news of Alex passing. It came as quite a shock because I had learned to not only admire him personally but to have great respect for his journalistic activity in the field of aviation safety.

JEROME LEDERER, Managing Director
Flight Safety Foundation
New York, N. Y.

My first personal contact with Alex, after years of reading his stories, was in the summer of 1951. Since then we were in contact with each other on numerous occasions, and my original favorable impression of him had grown into a genuine respect and friendship. It seems only yesterday that we were together at the ALPA Air Safety Forum, so much so that it is hard to believe that he is no longer with us.

WILLIAM W. MOSS
155 Southdown Road
Huntington, L. I., N. Y.

I am very grieved to hear the news of the death of Alex McSurely.

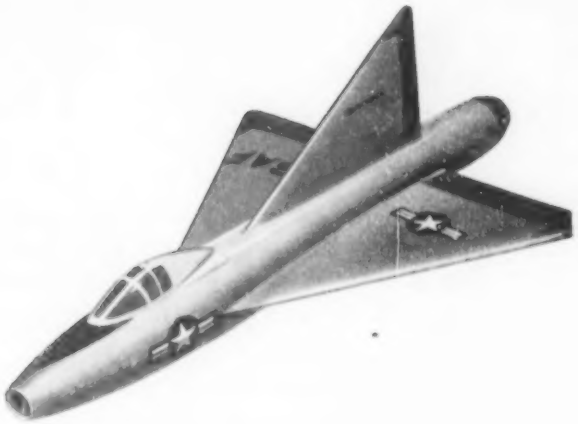
When I was junior officer at Wright Field years ago, Alex, as a young reporter for the Dayton Herald, would call on me regularly in his efforts to gather the news of what was happening in aviation. I learned to admire him then for his many abilities and for the accuracy and the integrity of his writings, and as a reporter and a good friend he was always welcome to drop by and chew the fat. Along with Frank Gregory, Frank Carroll, Bill Craigie and but few others, Alex was among the first to appreciate the military importance of the helicopter.

We of Hamilton Standard want you and Alex's family to know that we feel aviation has lost one of its best advocates and we have lost one of our best friends.

T. A. SIMS, Asst. Gen. Mgr.
Hamilton Standard Division,
United Aircraft Corp.
Windsor Locks, Conn.

We were quite saddened by the news of Mr. McSurely's recent death. Mr. McSurely displayed an exceptional interest and understanding, not only in the problems of the center, but also in its people as individuals. He had many friends here.

ALBERT BOYD, Maj. Gen., USAF
Office of the Commanding General
Wright Air Development Center
Wright-Patterson Air Force Base
Dayton, Ohio



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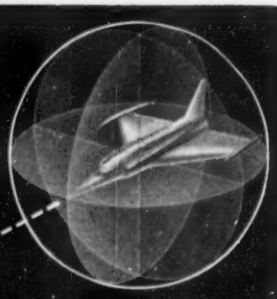

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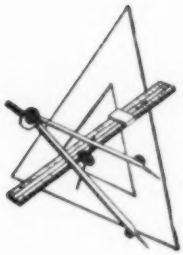

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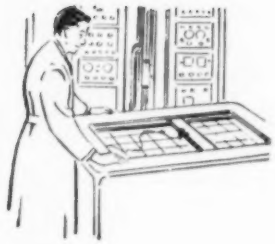

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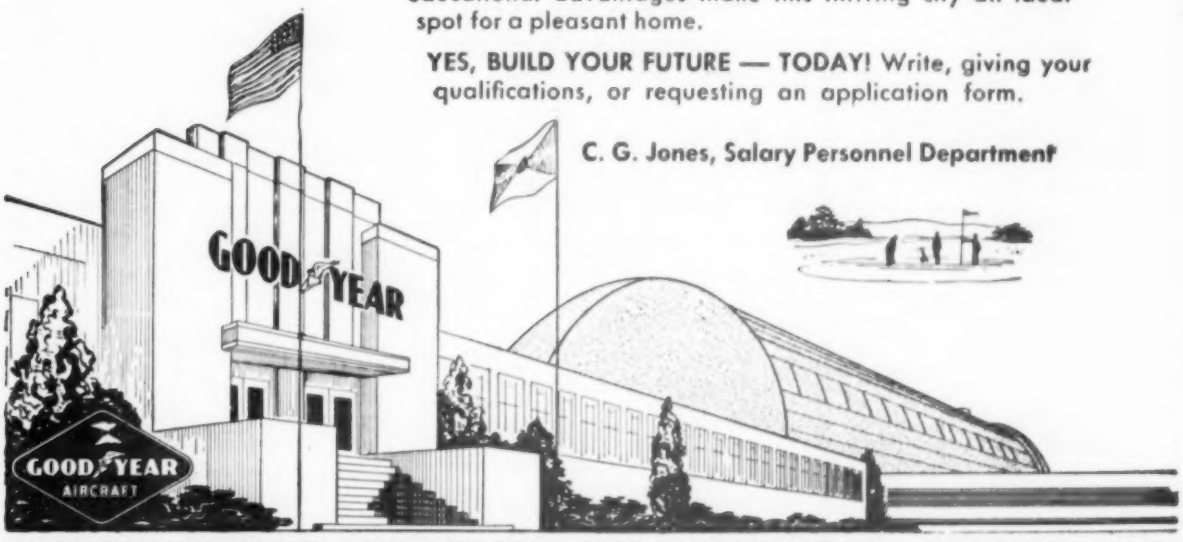

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P-9214, Aviation Week
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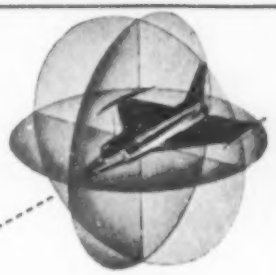

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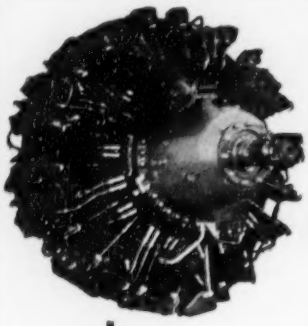

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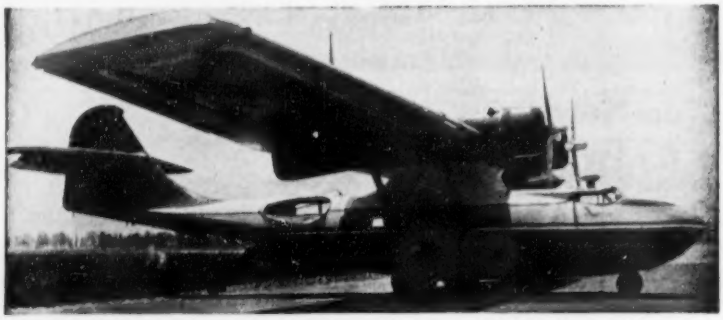

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Previously in this space (AVIATION WEEK Sept. 28, p. 88) the report of International Air Transport Assn.'s fifth technical conference regarding final approach and landing was discussed in general terms. Now let's be more specific; let's quote.

Obviously, little justice can be done to this report in a 500-word column. All we can do is pick a few significant passages to illustrate the substance of the work. In addition to advertising the document—for it deserves widespread recognition—we hope to underscore its mature, informed and, more important, practical thinking and how much this type of thought can mean to aviation.

▶ **Trend to Trivia**—The point often missed is that while considerable attention is given every day to the decimal point—the, in a sense, trivia—larger and more important practical matters of flying all too often go unattended.

Important though the Nth degree may be, there are countless factors in cockpit operations that can nullify completely all slide rule work.

For instance: We spend millions for fancy instrument approach systems and meticulously survey the results. Yet IATA (and the Society of Automotive Engineers) recommend "a permanently installed means of defogging and defrosting all cockpit panels (windshields) at any time that the airplane is in operation on the ground or in flight. This facility shall not cause discomfort to the crew." How about that? Think how many fancy approaches can be completely nullified by a fogged window.

Or the accuracy we strive for in instruments. So IATA reminds us "that instruments should be more clearly marked to take care of older pilots' needs; in fact, larger instruments might be required for their use." True. They are no good if you can not see them.

And this: Much energy is continually expended in developing "revolutionary" new gadgets. But, says IATA, "it was considered important not to upset unnecessarily current pilot habits as regards sensing; in other words, a new and more scientific method of instrumentation might be undesirable if it were contrary to the habits already fixed in the minds of . . . pilots." Right. Nothing is so well calculated to louse up a good approach than one of our "modern" electric compasses that turn backwards according to our previously acquired experience.

▶ **Runway Lighting**—Pilots long have howled about the inaccuracy and uselessness of our standard weather reports. The fifth technical conference says: "What the pilot wants to know is the maximum distance at which he can expect to see several approach lights. . . and several runway lights. . ." Me too.

Concerning lighting, "the meeting was reminded that the danger is now recognized of providing a good approach lighting system and neglecting requirements for runway lighting and runway markings. . . This has been described by pilots. . . as 'flying into a dark hole.'"

▶ **Indicative Teasers**—These snatches of the report cannot, of course, tell the whole story, nor are they necessarily the most important items. We just say they are indicative teasers to get you to read the unabridged copy.

There is something here for everyone. The subject list includes: electronic aids, aircraft performance and instrumentation, visual aids, critical height and economic aspects.

Aviation certainly needs more of this non-political, unbiased frankness. Apparently when intelligent pilots and other operations personnel get together, this is possible. We hope others take note.

AVIATION CALENDAR

Oct. 5-9—International Air Transport Assn., general meeting, Montreal.

Oct. 9-23—National Safety Congress and Exposition, Chicago. Aeronautical industries section will be held at the Hamilton Hotel, air transport section at the Conrad Hilton.

Oct. 10—England-Christchurch (New Zealand) air race.

Oct. 13-15—Air Transport Assn.'s annual Engineering and Maintenance Conference, Saxony Hotel, Miami Beach, Fla.

Oct. 14-15—Annual airport development and operation conference, sponsored by New York Department of Commerce, Onondaga Hotel, Syracuse, N. Y.

Oct. 14-16—American Institute of Electrical Engineers, sixth annual special conference on machine tools. Hotel Cleveland, Cleveland.

Oct. 15-16—Aircraft Electrical Society, 10th annual display meeting, Pan-Pacific Auditorium, Los Angeles.

Oct. 18—Formal dedication of Vermilion County Airport, Danville, Ill.

Oct. 21-23—National Metals Congress, City Auditorium, Cleveland.

Oct. 22-23—Radio Technical Commission for Aeronautics, 1953 fall assembly, Sheraton Park Hotel, Washington, D. C.

Oct. 23—National Advisory Committee for Aeronautics, annual meeting, Illinois University Institute of Technology, Champaign, Ill.

Oct. 23-24—Fourth annual National Noise Abatement Symposium, Armour Research Foundation of Illinois Institute of Technology, Chicago. Airplane and airport noise will be discussed by NACA's H. H. Hubbard.

Oct. 28-30—Southeastern Airport Managers Assn., annual convention, Marlin Beach Hotel, Ft. Lauderdale, Fla.

Nov. 3-4—1953 Transport Aircraft Hydraulics Conference, sponsored by Vickers, Inc., Hotel Park Shelton, Detroit.

Nov. 4-6—Society of Automotive Engineers, meeting of committee on aircraft hydraulic and pneumatic equipment, Statler Hotel, Washington, D. C.

Nov. 16-17—American Society for Quality Control, conference of the Aircraft Technical Committee, Biltmore Hotel, Dayton, Ohio.

Nov. 17-18—Operations Research Society of America, first regular meeting, National Bureau of Standards, Washington, D. C.

Nov. 17-20—Aviation Distributors and Manufacturers Assn., 11th annual meeting, Jefferson Hotel, St. Louis.

Nov. 19-21—National Aviation Trades Assn. 14th annual convention, Hotel Broadview, Wichita.

Dec. 17—Seventeenth Wright Brothers Lecture, U. S. Chamber of Commerce building, Washington, D. C.

Jan. 25-28—Plant Maintenance & Engineering Show, International Amphitheater, Chicago. Conference will be held concurrently at the Hotel Conrad Hilton.

Feb. 3-5—Society of Plastics Industry, ninth annual division conference on reinforced plastics, Edgewater Beach Hotel, Chicago.

May 5-7—Third International Aviation Trade Show, sponsored by Aircraft Trade Shows, Inc., 71st Regiment Armory, New York.

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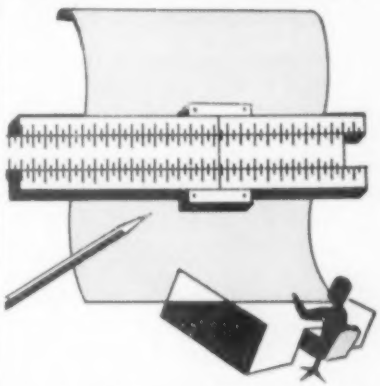

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EDITORIAL

Mr. Murray Goes to Town

Everything you hear in Washington about the Undersecretary of Commerce for Transportation, Robert Murray—as well as from the man himself—tells you there is a startling change under way in the government's attitude toward aviation.

Mr. Murray is empowered by the Eisenhower Administration to coordinate all government activities in transportation. He is a graduate of Harvard, a trained businessman, with a wide knowledge of municipal and state finance and government. He despises red tape and inefficiency. He has enough background in aviation to know what its crucial problems are, and he is determined that the parade to "Uncle Whiskers" for free money is at an end.

Mr. Murray's philosophy, activities and plans have been made readily available to AVIATION WEEK and the interested press generally. Our previous stories on Mr. Murray (Apr. 20, May 11, June 1 and Sept. 28) have recorded other aspects in the turnabout in federal attitude from the atmosphere that prevailed the past 15 or 20 years. For the first time in many a moon there is an active, forceful and intelligent aviation man in the Department of Commerce Secretariat.

Mr. Murray's line of authority runs directly to the Secretary of Commerce, thence to the White House. Under Reorganization Plan No. 21, which many had forgotten, the Commerce Department is charged not only with specific duties in the promotion of aviation, but with an overall responsibility for developing a sound and coordinated national transportation policy.

Now we have a Washington Administration, a Secretary of Commerce and an Undersecretary of Commerce who intend to make the most of this act passed by the previous Administration which did very little about it after putting it on the books. A cross-section of Mr. Murray's latest thinking during an hour's conference with several AVIATION WEEK editors a few days ago reveals:

He intends to make no appearances before CAB in any specific cases. This, he feels, would be in the manner of prejudging any case which it is the Board's responsibility to decide only after all of the evidence is in. He believes there is no direct line of authority between his office and that of CAB; that it goes directly to the White House which then officially passes along Administration policy to the Board itself. Actually, however, Mr. Murray said he probably would discuss informally with the chairman whatever comments were to be forwarded to the White House affecting CAB, as a matter of courtesy and information, with the expectation that the Board itself would take the initiative to conform to the policy before the White House had to notify it directly. But it would be Mr. Murray and the Secretary of Commerce who would promulgate aviation policy for the White House, in line with the overall policies of the Administration.

Mr. Murray favors passing back to the states and the municipalities as many responsibilities as possible—including airports and control towers. He is the wrong man for you to call in desperation if your local control tower is broke. "I couldn't be less interested," he told a recent municipal official who complained that their tower was rapidly running out of funds and, if it closed, the town would have to discontinue its airport operations. "If any community is not sufficiently interested to furnish money for its local control tower, it doesn't deserve an airport at all."

Mr. Murray apparently thinks, with some of the rest of us, that the Air Coordinating Committee has been pretty much a debating society. He intends to stop the debating and get some work done, and already has forced agreement by threatening to send one or two reports of "non-concurrence" to the White House for settlement.

Mr. Murray says that the Administration hopes in its upcoming study of transportation, which he will direct, to "pull all government transportation agencies together" in some kind of program that makes sense. "We may want to revise a lot of things," he said.

Mr. Murray believes that the shipping companies in the past 20 years have prepared a soft berth for themselves, subsidy-wise. You get the impression he is going to do something about this.

Those who have heard rumors that Mr. Murray will be a "railroad man" will be interested to know that he feels that while railroads are of vital importance to the nation, railroad management has been unenlightened and backward in many instances.

Without blaming anyone in particular, Mr. Murray believes Civil Aeronautics Board, for too long a time, has been operating merely on a day-to-day basis, case by case, without any consistent or long-range policy. "Maybe we can do something about this too," he said.

He believes the appointment of Fred Lee as Civil Aeronautics Administrator is a good appointment, but he makes it clear that he continually is being surprised at the general lethargy within the agency and the surprising (to him) unwillingness to allow any outsiders to help improve matters. CAA is in for more cuts, as previously reported in AVIATION WEEK, and the latest indications are that Public Information and the Legal Division will be the next to feel the axe. In our opinion, this is all to the good. Both groups in CAA have been bloated.

Mr. Murray is making news, much of it good news, some of it bound to bring a few worries to aviation people. He undoubtedly will make some mistakes, as who doesn't, but it is refreshing indeed to hear a Washington "bureaucrat" talk the way Mr. Murray talks, and furthermore, back this talk up with action.

It appears to us that aviation is in for some good old-fashioned overhauling in Washington, along the right lines, and we wish Mr. Murray luck!

—Robert H. Wood

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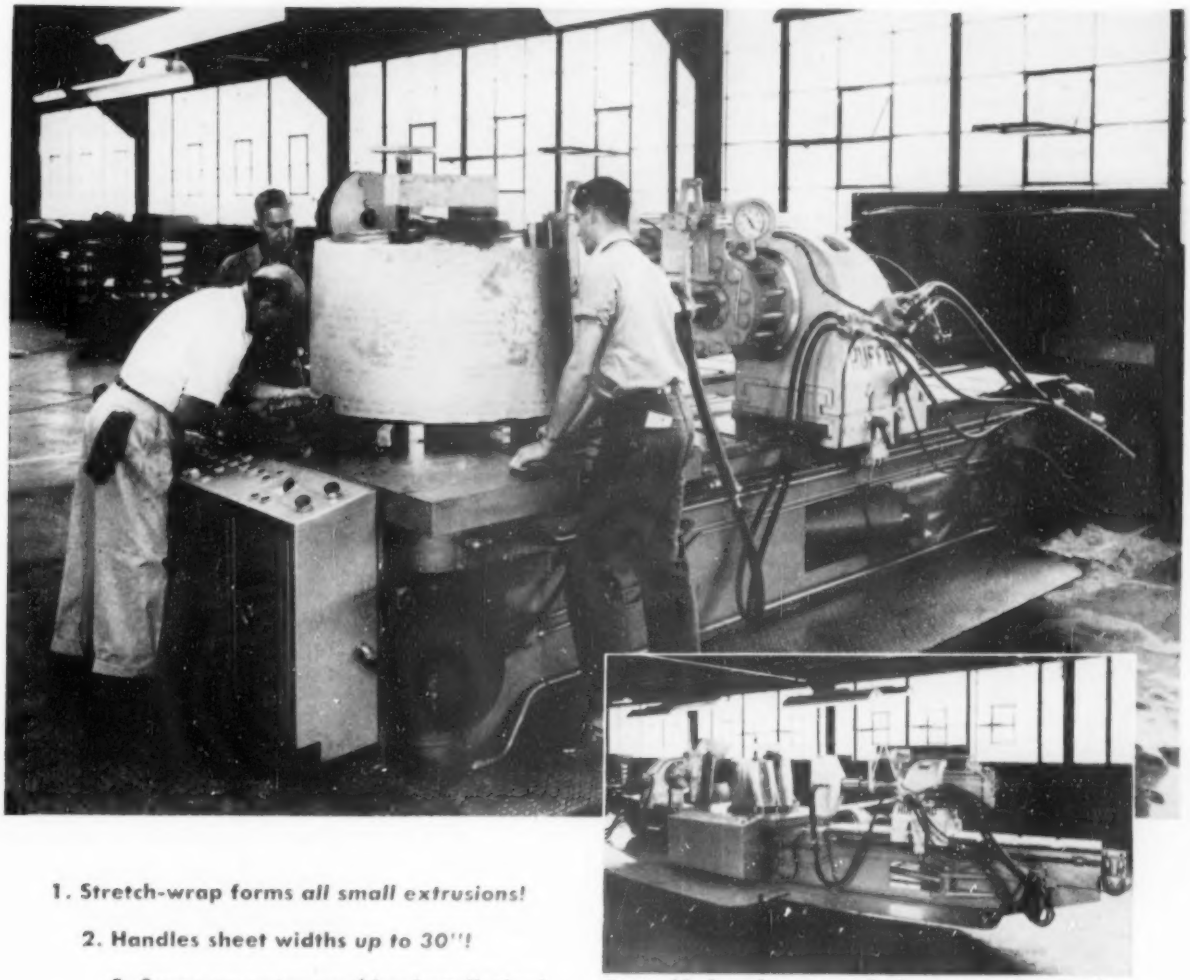

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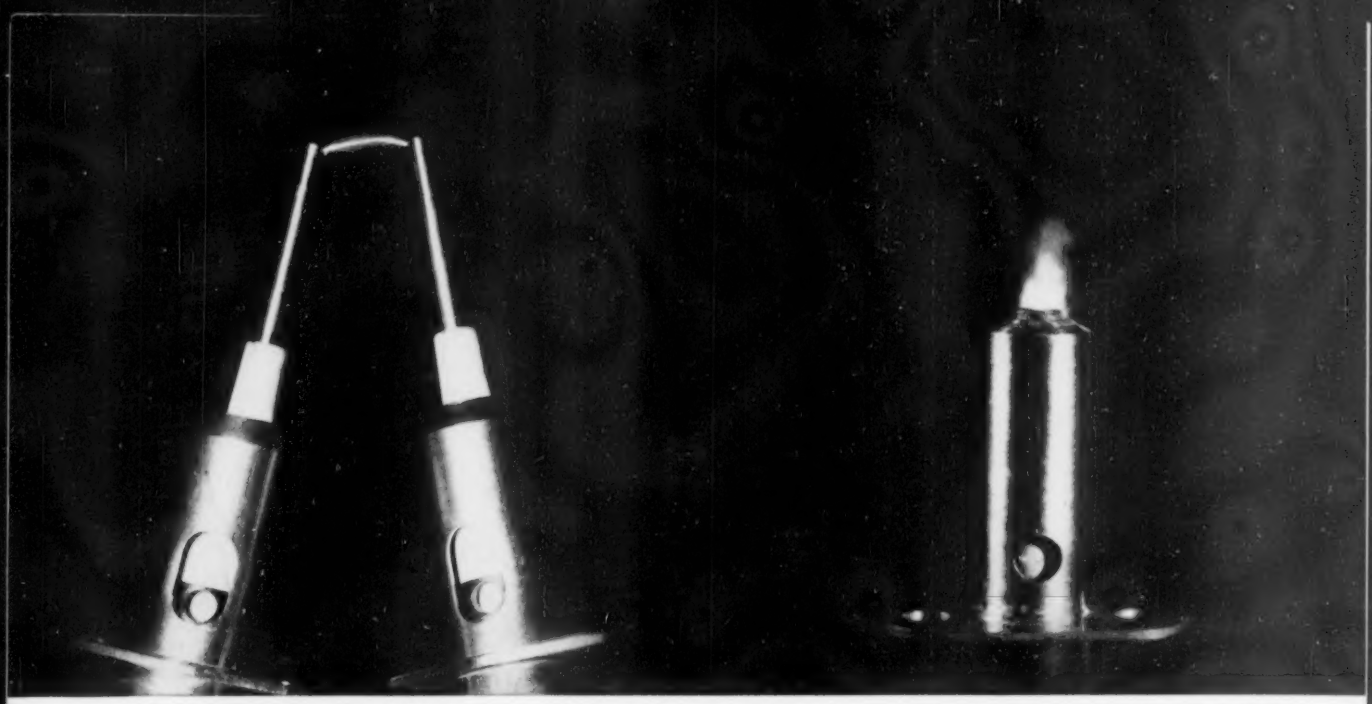

NEW G-E Capacitor Discharge Ignition System (right, above) gives more effective spark than "opposite polarity" ignition system (left).

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